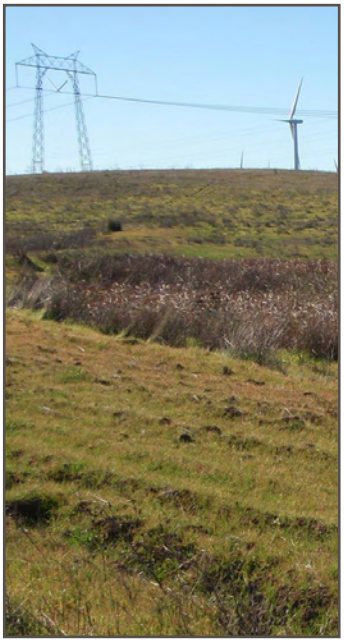
DRAFT

Habitat Conservation Plan
for the
Proposed Shiloh III Wind Plant Project, Solano County, California

October 2010



Prepared for:

enXco
An EDF EN Company

Prepared by:

ICF INTERNATIONAL

DRAFT
HABITAT CONSERVATION PLAN

FOR THE

PROPOSED SHILOH III WIND PLANT PROJECT, SOLANO COUNTY, CALIFORNIA

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October 2010

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ICF International. 2010. *Habitat Conservation Plan for the Proposed Shiloh III Wind Plant Project, Solano County, California*. Draft. October. (ICF 00263.09) Sacramento, CA. Prepared for enXco, Tracy, CA.

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Tables and Figures

Acronyms and Abbreviations

ABAG	Association of Bay Area Governments
BMP	best management practice
CFR	Code of Federal Regulations
CTS	California tiger salamander
CUP	Conditional Use Permit
ESA	Endangered Species Act
FAA	Federal Aviation Administration
HCP	Habitat Conservation Plan
ITP	incidental take permit
kV	kilovolt
mph	miles per hour
MW	Megawatts
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOA	Notice of Availability
O&M	Operation and Maintenance
Plan Area	4,570-acre Shiloh III property
project or proposed project	Shiloh III Wind Plant Project
SMUD	Sacramento Municipal Utility District
SWPPP	Storm Water Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WRA	Wind Resource Area

Chapter 1
Introduction

1.1 Overview

enXco has prepared this Habitat Conservation Plan (HCP) to satisfy requirements under Section 10 of the federal Endangered Species Act (ESA) for activities associated with development of the Shiloh III Wind Plant Project (project or proposed project).

enXco proposes to develop a commercially viable wind energy facility that would deliver renewable energy to the PG&E/CAISO power grid to meet California's Renewable Portfolio Standard goals and help reduce greenhouse gas emissions pursuant to AB32 and Solano County's (County's) General Plan. Up to 59 wind turbines, providing 320–400 million kilowatt hours (kWh) of renewable energy per year, would be built on the approximately 4,600-acre Shiloh III property (Plan Area) in Solano County (Figure 1-1). The project would be constructed in a location that supports suitable habitat for California tiger salamander (*Ambystoma californiense*), a species listed as threatened under the ESA. This HCP has been developed to ensure that impacts on this federally listed species are adequately avoided, minimized, and mitigated in accordance with requirements pursuant to Section 10(a)(2)(B) of the ESA.

1.2 Scope of the HCP

1.2.1 Permit Holder/Permit Duration

HCP implementing regulations (50 Code of Federal Regulations [CFR] § 17.22[b][3]) stipulate that the permit duration must be sufficient to provide adequate assurances to the permittees to commit funding necessary for the activities authorized by the permit, including conservation activities and land use restrictions. In determining the duration of the permit, the U.S. Fish and Wildlife Service (USFWS) must consider the duration of the planned activities, as well as the possible positive and negative effects on listed species.

The Section 10(a)(2)(B) permit holders would be enXco and, for a small portion of the project related to transmission interconnection, Pacific Gas and Electric Company (PG&E); hereafter, this HCP refers to both as the permittees. The permit duration for this HCP is 36 years, with a provision for renewal, if necessary. If the permit is not renewed, the turbines would be removed (see Section 2.2.3, *Decommissioning*). Project construction is expected to be completed by the end of 2011. enXco would obtain a Conditional Use Permit (CUP) for the proposed project from Solano County with a permit duration of 30 years (plus an expected option for up to 4 years of renewal), similar to the lease period for the privately owned properties in the Plan Area. The expected schedule is illustrated in Table 1-1. The project would continue until the leases and/or CUP have expired. enXco's initial conservation obligation—purchase of credits at a USFWS- and California Department of Fish and Game (DFG)–approved conservation bank—would be fulfilled upon permit issuance and prior to construction. Mitigation measures, involving impact avoidance and minimization measures as well

as restoration of the site as compensation for temporary impacts, would be carried out prior to, during, and immediately following construction. If restoration measures are required to address the effects of maintenance activities, these will be implemented immediately following the activity over the course of the permit duration; restoration measures will also be implemented during decommissioning. If enXco chooses to renew the leases and apply for an extended CUP from Solano County, then the incidental take permit (ITP) would also be renewed as stipulated in Chapter 11 of this document. If the lease is not renewed, then the site would be decommissioned and returned to preproject conditions within 2 years of lease expiration; the decommissioning process and restoration are covered under this HCP. The permit term is therefore sufficient to include the duration of the covered activities (30-year lease, possible CUP extensions, and subsequent 2-year decommissioning/restoration period) and to ensure the success of the proposed conservation measures as described in Chapter 5, *Conservation Strategy*.

Table 1-1. Shiloh III Anticipated Project Schedule

Activity	Time Frame
Obtain County CUP decision	October 2010
Obtain USFWS HCP/DFG 2081 decision	January 2011
Submit plans to County	February 2011
Begin construction	March 2011
End construction	September 2011
Periodic maintenance	As necessary
Lease renewal, CUP extension decision	June 2040
Extension, permit renewal and/or decommissioning	2041–2047
HCP expiration	January 2047

1.2.2 Plan Area

The Plan Area encompasses approximately 4,600 acres, comprising all the parcels on which wind turbines and related facilities would be constructed for the Shiloh III project (Figure 1-1). The Plan Area boundary is marked by the outer property lines of these specific lands where enXco has the landowners' permission to permit and construct the Shiloh III project.

1.2.3 Covered Species

California tiger salamander (CTS), federally listed as threatened under the ESA, is the single species covered by this HCP. An additional 22 state- and federally listed species potentially occurring in the Montezuma Hills Region were considered for inclusion in this HCP but are not covered for various reasons. These species, and the rationale for not including each in the HCP, are discussed in Appendix A.

1.2.4 Covered Activities

The activities covered under this HCP are the construction and installation of wind turbines and associated facilities and access roads, maintenance of the wind turbines and associated facilities, and decommissioning of the site if the lease is not renewed. Specifically, covered activities comprise

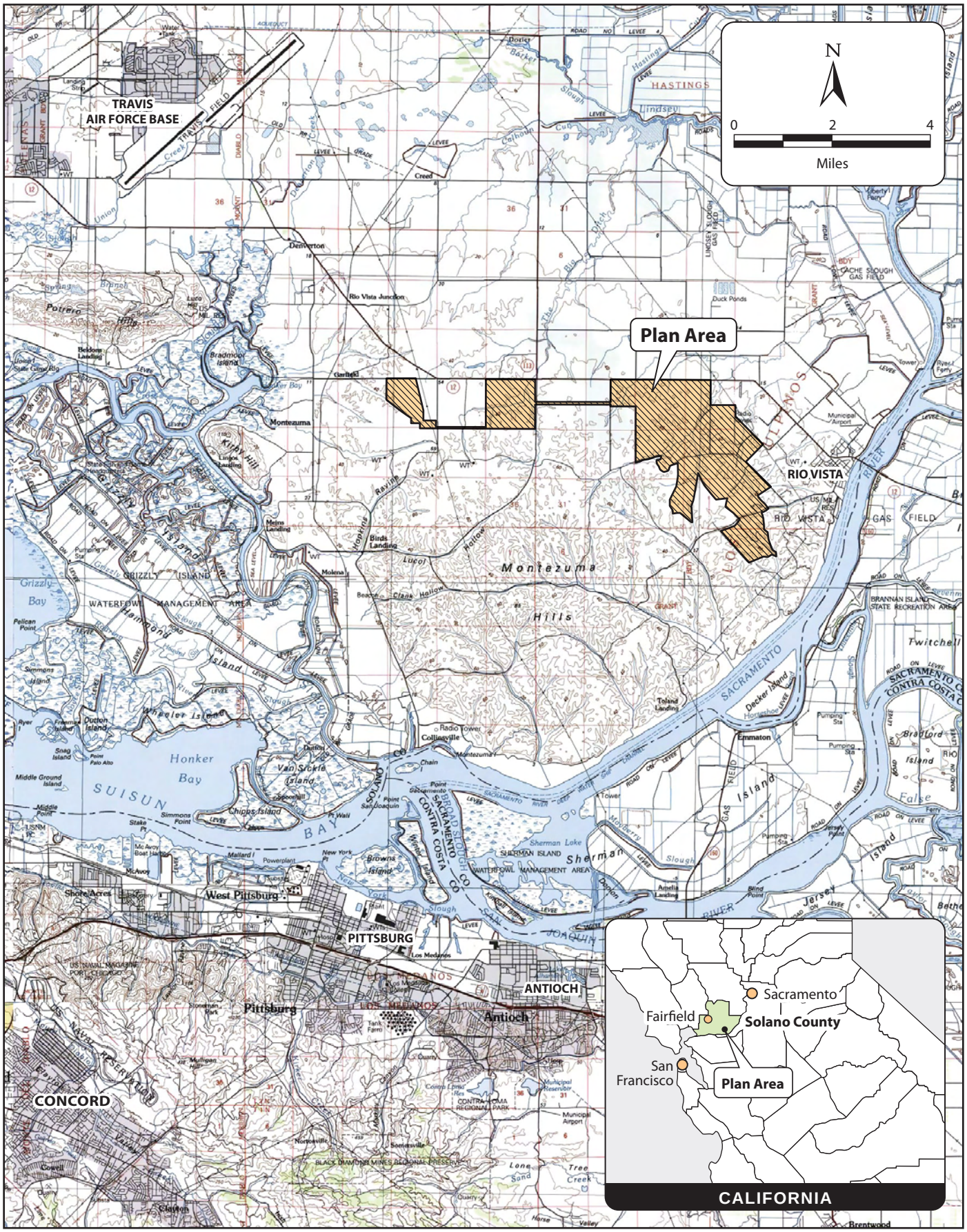

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Figure 1-1
Shiloh III Project Pegion

grading, excavation, trenching, installation of erosion control measures, installation of new roads, pouring footings to support turbines, installation of infrastructure (including PG&E's 230 kilovolt (kV) generation tie line), gravel placement for road maintenance, vehicle travel, transport of equipment and supplies, and other similar actions necessary to support the construction, and maintenance of the project. The HCP does not consider the operation of the turbine blades to be a covered activity.

1.3 Regulatory Framework

1.3.1 Federal Endangered Species Act

ESA and its implementing regulations prohibit the take of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10(a)(1)(B) of the ESA. ESA defines *take* as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 50 CFR 17.3 further defines the term "harm" in the take definition to mean any act that actually kills or injures a federally listed species, including significant habitat modification or degradation.

Section 10—HCP Requirements and Guidelines

Section 10(a) of ESA establishes a process for obtaining an ITP, which authorizes nonfederal entities to incidentally take federally listed wildlife or fish subject to certain conditions. Incidental take is defined by ESA as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Preparation of a conservation plan, generally referred to as an HCP, is required for all Section 10(a) permit applications. USFWS and the National Marine Fisheries Service (NMFS) have joint authority under ESA for administering the incidental take program. NMFS has jurisdiction over anadromous fish species, and USFWS has jurisdiction over all other fish and wildlife species.

The Section 10 process for obtaining an ITP has three primary phases: (1) the HCP development phase, (2) the formal permit processing phase, and (3) the post-issuance phase.

During the HCP development phase, the project applicant prepares an HCP that integrates the project or activity with the protection of listed species. An HCP submitted in support of an ITP application must include the following information.

- Impacts likely to result from the proposed taking of the species for which permit coverage is requested.
- Measures that will be implemented to monitor, minimize, and mitigate impacts; funding that will be made available to undertake such measures; and procedures to deal with changed and unforeseen circumstances.
- Alternative actions considered that would not result in take.
- Additional measures USFWS may require as necessary or appropriate for purposes of the plan.

The HCP development phase concludes and the permit processing phase begins when a complete application package is submitted to the appropriate permit-issuing office. A complete application package consists of (1) an HCP, (2) a permit application, and (3) a $100 fee from the applicant. USFWS complies with the National Environmental Policy Act (NEPA) by preparing an environmental

assessment and/or environmental impact statement, for which a Notice of Availability (NOA) is published in the Federal Register. The NEPA document is circulated for a 60- to 90-day public comment period. Once this period is complete, USFWS prepares an internal Section 7 Biological Opinion and a Set of Findings; a Section 10 ITP is granted upon a determination by USFWS that all requirements for permit issuance have been met. Statutory criteria for issuance of the permit are listed below.

- The taking will be incidental.
- The impacts of incidental take will be minimized and mitigated to the maximum extent practicable.
- Adequate funding for the HCP and procedures to handle unforeseen circumstances will be provided.
- The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild.
- The applicant will provide additional measures that USFWS requires as being necessary or appropriate.
- USFWS has received assurances, as may be required, that the HCP will be implemented.

The public is notified of permit issuance by means of the Federal Register. During the post-issuance phase, the permittees implement the HCP, and USFWS monitors the permittees' compliance with the HCP as well as the long-term progress and success of the HCP. Correspondence with USFWS is provided in Appendix B.

Section 7

Section 7 of ESA requires all federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any species listed under ESA, or to result in the destruction or adverse modification of its habitat. The issuance of an ITP is an authorization for take by a federal agency. Consequently, in conjunction with issuing a permit, USFWS must conduct an internal Section 7 consultation on the proposed HCP. The internal consultation is conducted after an HCP is developed by a nonfederal entity and submitted for formal processing and review. Provisions of Sections 7 and 10 of the ESA are similar, but Section 7 requires consideration of several factors not explicitly required by Section 10. Specifically, Section 7 requires consideration of the indirect effects of a project, effects on federally listed plants, and effects on critical habitat. The internal consultation results in a Biological Opinion prepared by USFWS regarding whether implementation of the HCP would result in jeopardy to any listed species or would adversely modify critical habitat.

1.3.2 National Environmental Policy Act

NEPA requires that federal agencies analyze the environmental impacts of their actions (in this instance, issuance of an ITP) and include public participation in the planning and implementation of their actions. NEPA compliance is obtained through one of three actions: (1) a categorical exclusion (allowed for low-effect HCPs), (2) preparation of an environmental assessment (generally prepared for moderate-effect HCPs); or (3) preparation of an environmental impact statement (generally prepared for high-effect HCPs). The NEPA process helps federal agencies make informed decisions with respect to the environmental consequences of their actions and ensures that measures to

protect, restore, and enhance the environment are included, as necessary, as a component of their actions.

Chapter 2
Land Use and Covered Activities

2.1 Land Use

The Plan Area is in an actively farmed area of Solano County with adjacent wind farms. The primary land uses in the Plan Area are grazing and dryland farming, and nine rural residential dwellings are present. Small portions of the Plan Area are also being used for natural gas exploration, drilling, and extraction. These ongoing uses are not under the control of the permittees and are not covered activities under this HCP.

2.1.1 Surrounding Land Use

Most of the surrounding land consists of agriculture (dryland farming and grazing). Surrounding communities include Bird's Landing, approximately 6 miles from the western border of the Plan Area, and Rio Vista, approximately 1 mile east of the project.

In addition to agricultural use, the Montezuma Hills region surrounding the Plan Area hosts energy producing facilities, most notably wind turbine generators in the Sacramento Municipal Utility District (SMUD) project area, the High Winds LLC project area, the enXco V (formerly US Windpower) project area, the Shiloh I project area, and the Shiloh II project area (Figure 2-1).

2.1.2 Land Ownership

The Plan Area is entirely under private ownership. It comprises 35 parcels owned by 23 local private landowners. enXco does not own any of the land in the Plan Area, but leases it for the proposed wind plant project.

2.1.3 Solano County General Plan Zoning

Land within the Plan Area is zoned Exclusive Agriculture (A-160) according to the Code of Solano County, Zoning Regulations. Wind farms are allowed as conditional uses in Exclusive Agricultural zone designations. The project is also within one of the County's designated WRAs identified in the Resources Element of the General Plan.

enXco must obtain a CUP to develop the project. The project must also comply with requirements, including setbacks, set forth in the Solano County General Plan with respect to wind energy development.

2.2 Covered Activities

The objective of the proposed project is to develop a commercially viable wind energy facility that would deliver renewable energy to the PG&E/CAISO power grid to meet California's Renewable Portfolio Standard goals and help reduce greenhouse gas emissions pursuant to AB32 and the

County's General Plan. To meet this objective, the proposed project would entail the elements listed below. All activities associated with construction of the project are considered covered activities under the HCP.

- Install approximately 59 wind turbines, with associated generators, towers, foundations, and pad-mounted transformers.
- Enable the generation capacity of approximately 130–160 megawatts (MW) of electricity to contribute to California's Renewable Portfolio Standard goal of 30% reduction by 2020 pursuant to AB32.
- Install support facilities including access roads, control cables, power collection cables, and transmission lines necessary to serve the project.

2.2.1 Project Construction

Project Design and Construction

Shiloh III is new project to be developed in the Montezuma Hills area adjacent to the recently permitted and built 130–160 MW Shiloh II project. The Shiloh III substation would be located at one of two possible locations within the Shiloh III Plan Area. Substation Option 1 would connect to PG&E's existing transmission line by a 350-foot overhead line. Substation Option 2 would be connected to the transmission lines in the area by a newly constructed overhead transmission line approximately 0.25 mile long; the construction of this transmission interconnection would be the responsibility of PG&E. The existing transmission facility in the Montezuma Hills would be used for the Shiloh III project and would not require any expansion.

The project would require the construction of access roads, foundations for wind turbine towers and meteorological towers, underground power lines, PG&E's 230 kV line, and other minor support facilities such as staging and storage areas. Grading would be required for the construction of new access roads, the improvement of existing access roads, and the construction of pads to support wind turbine foundations. To minimize the amount of earth movement, grading would follow existing elevation contours to the degree possible; moreover, the project has been designed to avoid wetlands, low-lying drainage areas, and residences throughout the Plan Area. Wetlands are being avoided through siting and subsurface horizontal directional drilling (HDD).

Turbines

Approximately 59 wind turbines would be placed in the Plan Area. Each turbine would have a 2.0 or 2.5 MW generation capacity.

Three turbines types (Repower MM 92-2.0 MW, Clipper Liberty 2.5 MW, and Vestas V90-2.0 MW) are being considered for the project. All three have the same approximate rotor diameter. Despite their differing energy outputs, the selection would not affect the overall turbine configuration because of their similarities in size. The turbine type ultimately selected for the proposed project would depend primarily on product availability and the manufacturer's ability to support the construction schedule.

In the context of this document, the term *wind turbine*—or *turbine*—refers to the entire structure that produces electricity: three rotor blades, a nacelle (the housing for the generator, which is connected via a gear box to the blades), and a tubular tower (Figure 2-2).

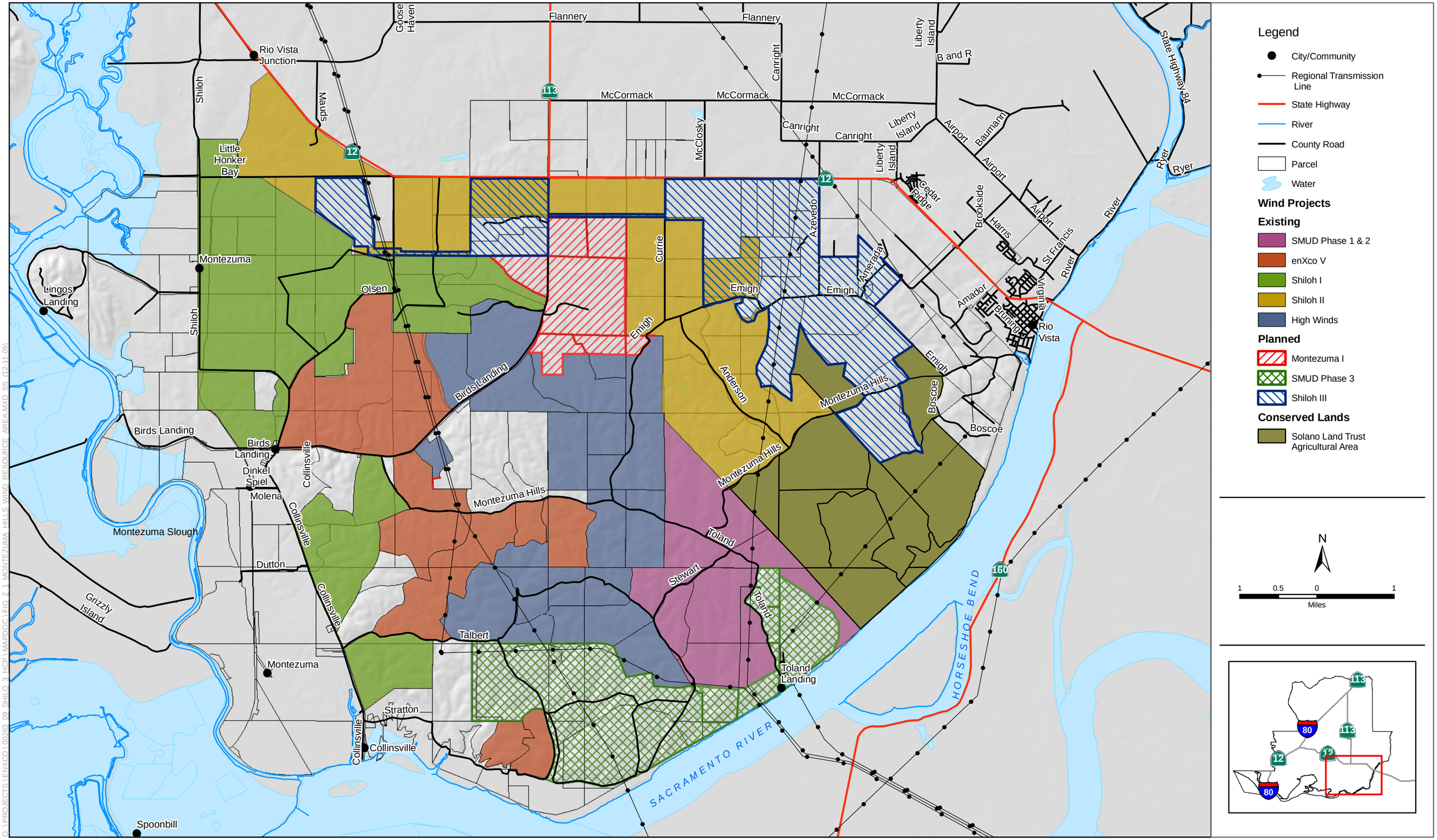

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Figure 2-1
Montezuma Hills
Wind Resource Area

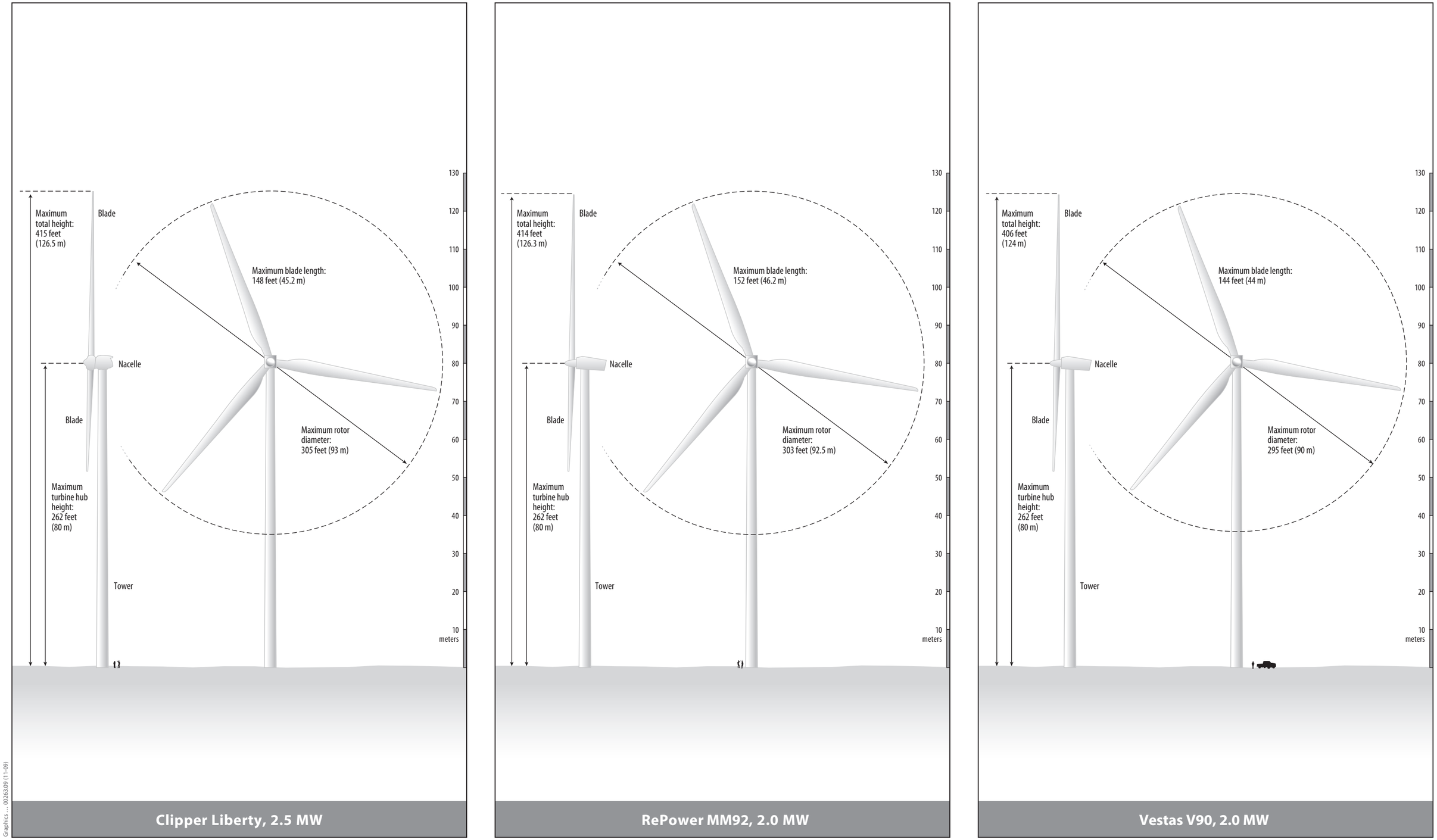

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Figure 2-2
Turbine Options

Each wind turbine, including the rotor blade (when pointing straight up), would be a maximum of 415 feet (126.5 meters) tall. Each tower (measured to the rotor hub) would be a maximum of 262.5 feet (80 meters) tall. The rotor blades would be a maximum of 304 feet (93 meters) in diameter. The turbine towers would be painted a neutral color to reduce their visibility.

The proposed project must comply with Federal Aviation Administration (FAA) rules for interference with navigational systems (including radar), structural lighting, locations, and height. Specific FAA requirements for the proposed project would be developed in coordination with the FAA and Solano County.

For protection from potential lightning strikes, each wind turbine, including the rotor blades, is equipped with a lightning protection system. The lightning protection system is connected to an underground grounding arrangement to facilitate lightning flow to the ground. In addition, all equipment, cables, wind turbines, and structures would be connected by a robust metallic, project-wide grounding network.

Wind turbine towers would be set back from public rights-of-way and existing residences in accordance with Solano County requirements. All turbine towers would be locked, and the substation would be fenced and locked to prevent unauthorized entry.

Foundations

The freestanding tubular towers would sit atop steel and concrete foundations designed for the specific soil conditions at the individual turbine sites. The foundation design would be based on site-specific conditions and the design engineer's requirements.

Turbine Locations

Approximately 59 turbines would be placed across the Plan Area (Figure 2-3). The preliminary turbine placement plan was developed using computerized modeling software that incorporates wind resource considerations from meteorological data collected in the Plan Area, long-term weather data, Plan Area topography, and environmental factors including the location of wetlands, vernal pools, alkali meadows, and sensitive plant species. The wind turbines would be situated to maximize exposure to wind from all directions, with emphasis on exposure to the prevailing southwesterly wind direction through the Plan Area. Sufficient spacing was established between wind turbine towers to minimize turbulence between and among the turbines.

Turbines are sited to maximize the wind capacity in the area. Special consideration, however, is given to siting all turbines at least 0.25 mile from SR 12, a designated scenic route, as required by Solano County.

Power Collection System

The project's power collection system would collect the power produced by the turbines. Power generated by each turbine is fed into a pad-mounted transformer, which is in turn connected to an array of junction boxes distributed throughout the Plan Area to facilitate power collection. Collection lines for the project would be installed underground from each turbine site to the substation.

In most cases, collection lines are constructed by excavating a trench; laying power collection lines; and recovering, recompacting, and reseeding soil above the collection line. Where the collection

lines could intersect with seasonal wetlands, enXco will use HDD. HDD is expected to be necessary in approximately 11 locations (Figure 2-3). HDD bores can be steered: this allows the bore machine to sit at ground level, bore down and along the alignment, and direct the bore back up to the surface at a distant point. The bore machine uses a drilling fluid in the drilling process. The drilling fluid is typically 5% fine clay (such as bentonite) mixed with 95% fresh water. The clay and water mixture coats the wall of the borehole to help hold it open and to provide lubrication for the drill stem and conduit being installed. The drilling fluid is circulated back to the bore site for filtering and reuse.

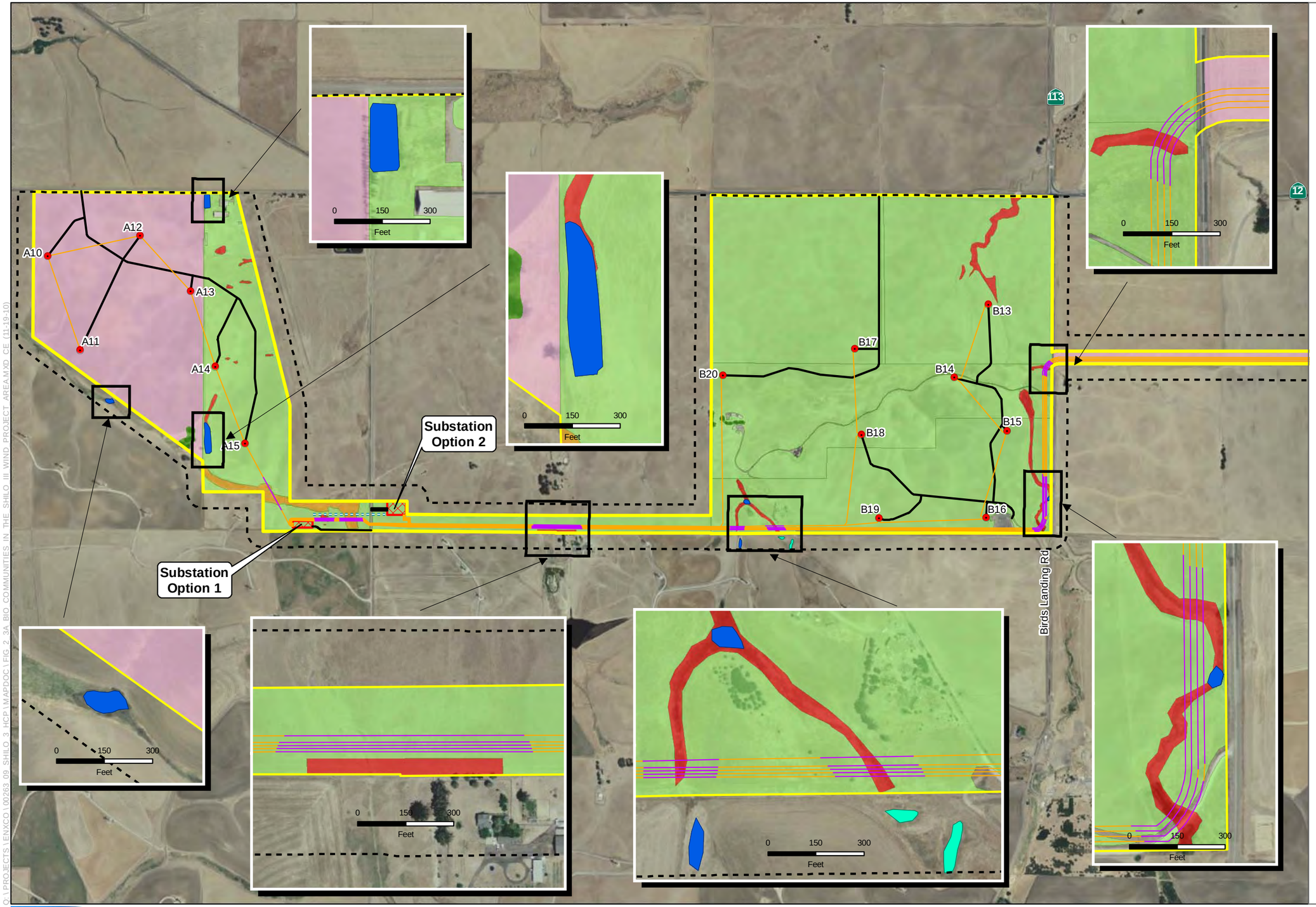
The Shiloh III substation, centrally located in the Plan Area, would connect to the underground system carrying electricity from the individual turbines. The substation would step up the voltage generated by the turbines and collected through the power collection system to meet the electrical transmission system's higher 230 kV voltage. The Option 1 location would connect with the transmission line by a new 350-foot transmission line. The Option 2 location would connect to existing PG&E facilities via a new 0.25-mile transmission line. Either transmission line would be constructed by PG&E and would entail the installation of approximately five "short poles" under Option 1 and five 80-foot transmission towers and several "short-poles" under Option 2 to connect with the nearby transmission line. The substation access road in Option 1 would require installation of approximately 1 culvert; Option 2 would require installation of approximately two culverts and a small (4- by 4-foot) catchment basin.

2.2.2 Maintenance

Maintenance activity in the Plan Area would consist of equipment replacement, collection system repair, and gravel application and repair to roads as necessary. Maintenance-related impacts would occur within the footprint of the originally designated disturbance areas. Road gravelling and repairs would be limited to the footprint of the existing and new roads. Turbines may need to be repaired or replaced at a rate of approximately one every 5 years. No new permanent effects are anticipated during maintenance activities, and temporarily affected areas would be restored within 1 year of disturbance.

2.2.3 Decommissioning

If the lease is renewed, then the Incidental Take Permit would also be renewed as described in Chapter 11 of this HCP. If the lease is not renewed, then the site would be decommissioned. The roads would be removed unless the landowner desires that they be retained (in accordance with County regulations and County permit terms). All hard facilities, including turbine foundations and wires at the substation, would be removed to a depth of 3 feet during the dry season. Large equipment would be necessary to remove the roads and return them to grade. All decommissioning-related ground disturbance would be temporary, limited to the original disturbance footprint, and returned to preproject conditions within 1 year of ground disturbance.



Legend

- Shiloh III Project Area
- Electrical Collection Line
- Directional Drilled Electrical Collection Line
- Proposed PG&E Tie-in to Substation
- Shiloh III Project Area 250 Foot Buffer
- Match Line
- Proposed Turbine Location
- Proposed Road
- Substation
- Agriculture
- Alkali Meadow
- Annual Grassland
- Bulrush-Cattail Wetland
- Eucalyptus
- Pond
- Seasonal Wetland
- Vernal Pool

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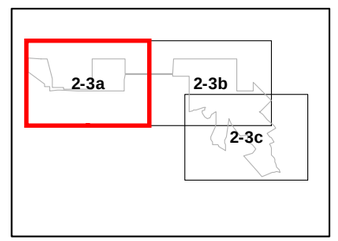
Feet

Insets of ponds and vernal pools are shown at a larger scale to provide greater detail.



Base Map: ESRI Stream Imagery, iCubed 2009

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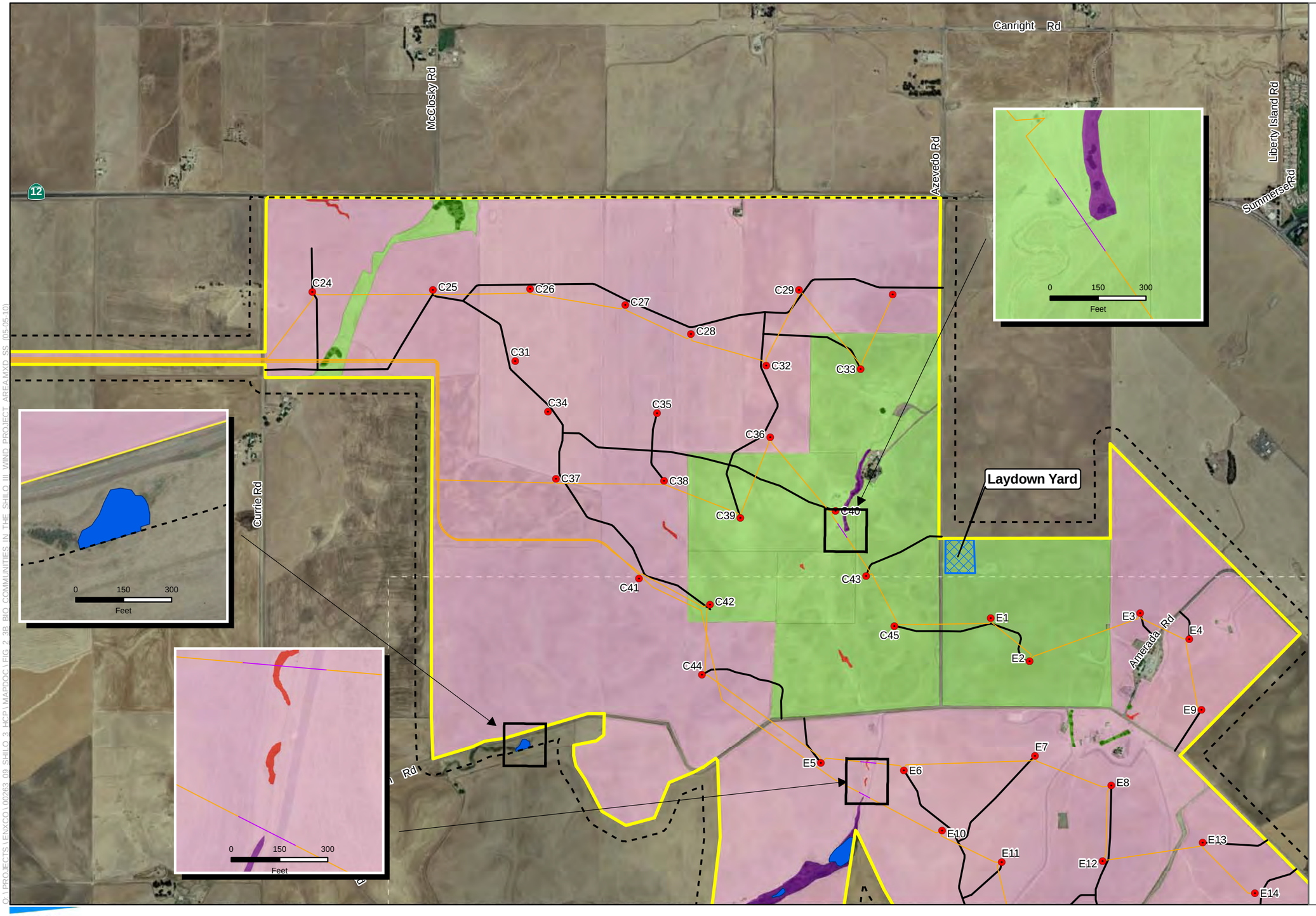
Figure 2-3a
Biological Resources in the Project Area



Legend

- Shiloh III Project Area
- Shiloh III Project Area 250 Foot Buffer
- Match Line
- Proposed Turbine Location
- Electrical Collection Line
- Directional Drilled Electrical Collection Line
- Proposed Road
- Laydown Yard
- Agriculture
- Alkali Meadow
- Annual Grassland
- Bulrush-Cattail Wetland
- Eucalyptus
- Pond
- Seasonal Wetland
- Vernal Pool

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1,500 750 0 1,500
Feet

Insets of ponds and vernal pools are shown at a larger scale to provide greater detail.

Base Map: ESRI Stream Imagery, iCubed 2009

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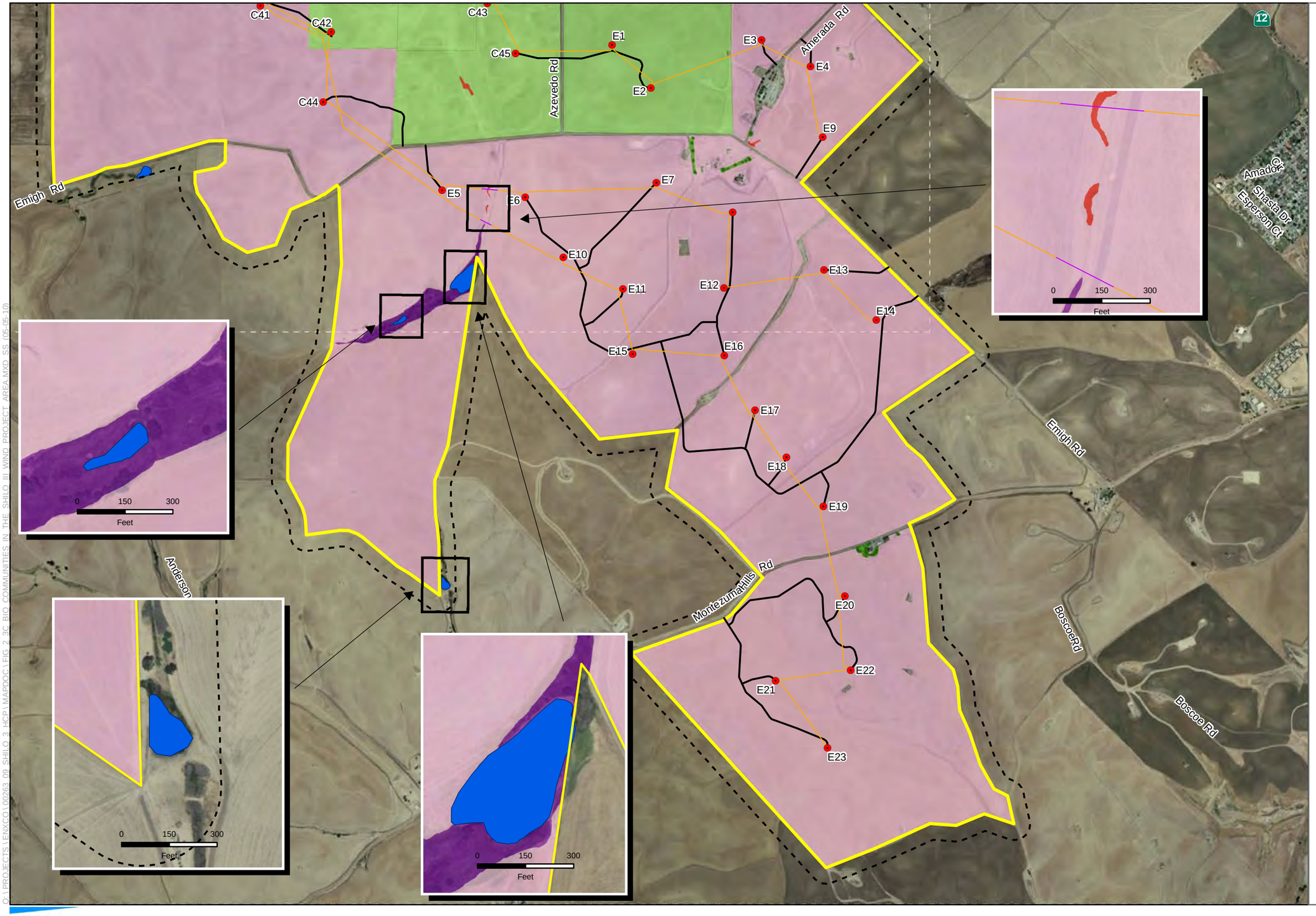
Figure 2-3b
Biological Resources in the Project Area



Legend

- Shiloh III Project Area
- Shiloh III Project Area 250 Foot Buffer
- Match Line
- Proposed Turbine Location
- Electrical Collection Line
- Directional Drilled Electrical Collection Line
- Proposed Road
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N

1,500 750 0 1,500
Feet

Insets of ponds and vernal pools are shown at a larger scale to provide greater detail.

Base Map: ESRI Stream Imagery, iCubed 2009

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Figure 2-3c
Biological Resources in the Project Area

Chapter 3
Physical and Biological Resources

3.1 Physical Resources

3.1.1 Location and Setting

The approximately 4,600-acre Plan Area is approximately 3 miles west of Rio Vista and 18 miles southeast of Fairfield (Figure 1-1). It consists of three areas connected by a linear easement corridor—an eastern area encompassing approximately 3,516 acres, a central area encompassing approximately 679 acres, and a western area encompassing approximately 365 acres. The west and central areas are separated by approximately 1 mile, the central and eastern areas by approximately 1.5 miles. Access to the Montezuma Hills is via State Route (SR) 12, with primary access to the Plan Area from, Birds Landing Road, Currie Road, Olsen Road, Emigh Road, Anderson Road, and Little Honker Bay Road.

3.1.2 Topography

Located in the Montezuma Hills Wind Resource Area (WRA), the Plan Area is characterized by rolling hills. The Montezuma Hills have a relatively constant crest elevation between 100 and 272 feet above mean sea level. Valleys on the project sites transition to sloped hillsides with relatively flat ridgelines. The Sacramento and San Joaquin Rivers lie to the south.

The predominant landform is a relatively uniform pattern of treeless hills separated by narrow valleys and drainages that provide visual corridors and limited protection from the wind. In this portion of the county, the topographic and meteorological conditions consistently produce strong, steady winds.

From the vicinity of SR 12, Currie Road, Azevedo Road, and Emigh Road at the northern and eastern portions of the Plan Area, the site generally drains into several small unnamed streams that ultimately flow through numerous adjacent parcels toward the southeast, ultimately reaching the Sacramento River approximately 2 miles south of Rio Vista.

Topography in the western portion—in the vicinity of Little Honker Bay Road—is similar to that in the eastern portion, except surface flows drain into one small unnamed stream that flows to the northwest. Flows continue through several small unnamed streams, ultimately reaching Denverton Slough and Little Honker Bay, tributaries of the Suisun Marsh.

3.2 Biological Resources

3.2.1 Vegetation Communities

The distribution and abundance of the nine biological communities present in the Plan Area are shown in Figure 2-3 and described below.

Agricultural Lands

Agricultural uses, including dryland farming and livestock grazing, are the dominant land uses in the Plan Area. As of October 2009, approximately 70% of the Plan Area was in wheat production or was in preparation for wheat production, with the remainder being utilized as grazing lands. The farmers in the Montezuma Hills typically use a 1- to 3-year crop rotation cycle, where grazing and fallow years follow planting and harvesting. A typical rotation cycle includes several tilling passes in the summer/ early fall, planting in late fall, harvest the following summer, and grazing for up to a year, after which the cycle begins again.

Annual Grassland

After agricultural lands, annual grassland is the most common vegetation type in the Plan Area. The largest area of annual grassland is in the central portion of the Plan Area between Olsen Road and Birds Landing Road, adjacent to SR 12. This patch of grassland is currently utilized for grazing and does not appear to have been plowed or disked in the recent past. Annual grassland habitat such as that found in the Plan Area is relatively uncommon in the Montezuma Hills region because most areas in the region are under intensive cultivation.

The annual grassland in the Plan Area is dominated by nonnative annual grasses such as ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), and Italian ryegrass (*Lolium multiflorum*). No native grasses appear to be present. Annual grassland in the Plan Area also supports a diverse forb flora that includes filaree (*Erodium* spp.), fiddleneck (*Amsinckia menziesii* var. *intermedia*), yellow star-thistle (*Centaurea solstitialis*), and scattered native perennial and annual forbs.

Eucalyptus and Ornamental Trees

Several groves of eucalyptus and other ornamental trees are present in the Plan Area. These groves are typically present around residences or abandoned homesteads and were planted as windbreaks or for landscaping.

Wetlands and Aquatic Habitats

In the characterization of wetlands and aquatic habitats, features within a 250-foot buffer around the Plan Area boundary (with the exception of those portions of the boundary that abut SR 12) were considered to ensure that features adjacent to the Plan Area be evaluated for potential indirect effects as well as effects on associated upland habitat.

Bulrush-Cattail Wetland

Bulrush-cattail wetlands occur in topographically low-lying areas throughout the Plan Area and along some seasonal streams. Generally, they are long, relatively narrow corridors characterized by erect, rooted, herbaceous hydrophytes (i.e., species adapted to very wet conditions). The species composition varies in these wetlands, but many are monotypic stands of cattail (*Typha latifolia*) or common tule (*Scirpus acutus*). These wetlands are typically surrounded by the seasonal wetland type (described below), which constitutes a transition to the upland community.

Seasonal Wetland

Seasonal wetlands typically occur in topographically low-lying areas along the edges of bulrush-cattail wetlands and along seasonal creeks. The primary distinction between these two types of wetlands is the length of time each is inundated with water. Bulrush-cattail wetlands typically retain water for extended periods into the growing season, while seasonal wetlands usually flood or are saturated for short periods and do not remain inundated for very long into the growing season. Dominant species found in seasonal wetlands in the Plan Area include Italian ryegrass, pale spikerush (*Eleocharis macrostachya*), bird's-foot treefoil (*Lotus corniculatus*), Baltic rush (*Juncus balticus*), and curly dock (*Rumex crispus*).

Alkali Meadow

Alkali meadow is uncommon in the Plan Area, occurring in only one location adjacent to Olsen Road. This community supports halophytic (salt tolerant) herbaceous plants such as saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), and alkali weed (*Cressa truxillensis*). This community also supports Carquinez goldenbush (*Isocoma arguta*) and pappose spikeweed (*Centromadia parryi* ssp. *parryi*), both of which are California Native Plant Society special-status plants.

Vernal Pool

Two disturbed vernal pools were mapped within 250 feet of the Plan Area between Birds Landing Road and Olson Road. Vernal pools are depressions in the landscape that pond water intermittently during the rainy season and are completely dry during late spring and summer. These areas pond because they typically contain an impervious soil layer that prevents water from infiltrating into the lower soil layers. Because of their distinctive hydrological regime, they support a highly specialized flora adapted to prolonged inundation and subsequent dry periods. They were historically widespread throughout the region, but their extent is now limited due to development and agricultural conversion over the last 150 years. Vernal pools are considered sensitive natural communities because they support specialized plant associations, provide tremendous diversity in a small area, and provide seasonal habitat for dependent common and special-status wildlife species. The vernal pools were mapped because they likely meet USACE criteria to be considered wetlands under Section 404 of the CWA; however, field observations have indicated that the pools are substantially degraded, with the hardpan possibly broken, and do not appear to pond for more than 1 month. They are up gradient and outside the plan area and will be more than 100 feet from the collection line construction corridor. Plant species observed in vernal pools are typical of disturbed vernal pool habitats in the region; they include slender popcornflower (*Plagiobothrys stipitatus*), coyote thistle (*Eryngium aristulatum*), toad rush (*Juncus bufonius*), and smooth boisduvalia (*Epilobium pygmaeum*).

Seasonal Stream

Seasonal streams are relatively common in low-lying portions of the Plan Area. Numerous other features that are shown as "blue-line" streams on the U.S. Geological Survey (USGS) topographic maps are also present in the Plan Area. In the Montezuma Hills, these blue-line streams typically exhibit intermittent stream characteristics (such as a defined bed and bank and/or scour) or no stream characteristics at all. Several roadside drainages specifically constructed for the purpose of removing and channeling runoff from roads are also present in the Plan Area.

Pond

Five ponds are present in the Plan Area; five others are adjacent to the Plan Area within the 250-foot buffer. The ponds are variable in size and duration of ponding, and all have been constructed by landowners for agricultural or personal use. All the ponds appear to impound seasonal streams and are entirely supported by runoff from surrounding lands. Vegetation is variable, but most ponds are open water with a narrow ring of emergent wetland vegetation along the edges. Most dry completely or nearly completely by mid- to late summer. A few small willows (*Salix* sp.) are often present around ponds in the Montezuma Hills area, but extensive riparian areas are generally lacking.

3.2.2 Covered Species (California Tiger Salamander)

The species covered under this HCP is California tiger salamander. Other species considered for inclusion but not covered under this HCP are listed in Appendix A, with the rationale supporting the decision to exclude.

CTS is a large terrestrial salamander with a broad, rounded snout. Adult lengths up to 8.2 inches have been recorded (Stebbins 2003). Tiger salamanders exhibit sexual dimorphism, with males tending to be larger than females. Typical adult coloration is a black body with random white or yellowish markings that tend to be more concentrated on the sides of the body.

CTS larvae are roughly one-half inch long at hatching. They have yellowish gray bodies; broad fat heads; large, feathery external gills; and broad dorsal fins that extend well up their backs. They can grow to more than 2 inches before metamorphosis (69 FR 149 47215).

Geographic Distribution

CTS is endemic to California. This species historically occurred at elevations up to 3,900 feet (Shaffer et al. 1993; Jennings and Hayes 1994) from Sonoma County south to Santa Barbara County along the Coast Ranges, and from northern Yolo County south to northwestern Kern and northern Tulare Counties in the Central Valley and surrounding foothills.

CTS presently occurs in reduced and fragmented portions of its historic range (Figure 3-1). Moreover, USFWS recognizes two distinct population segments—one in the Santa Maria area in Santa Barbara County, and the other in the Santa Rosa Plain in Sonoma County—to be at greater peril than the remainder of the species; accordingly, these distinct population segments have been federally listed as endangered.

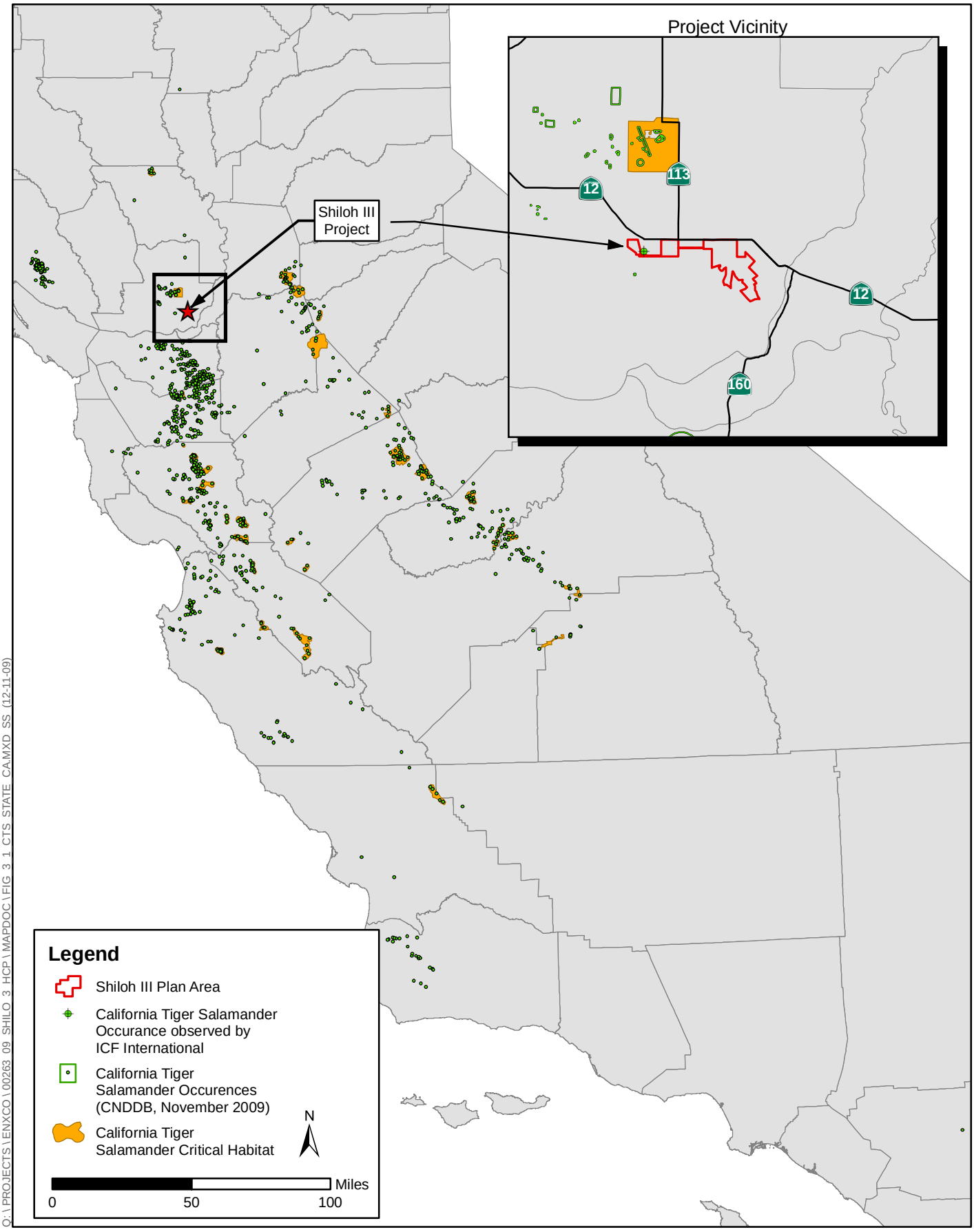

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Figure 3-1
California Tiger Salamander Occurences

Life History and Habitat Requirements

CTS has an obligate biphasic life cycle (Shaffer et al. 2004). The larvae develop in vernal pools and ponds, but the species is otherwise terrestrial and spends most of the post-metamorphic phase in underground retreats (Shaffer et al. 2004; Trenham et al. 2001). As a result of spending most of their lives underground, CTSs are rarely encountered even where they are abundant. Subadults and adults typically spend the dry summer and fall periods in the burrows of California ground squirrels (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and other small mammals (Trenham 1998). CTSs may also use other landscape features, such as leaf litter or cracks in desiccated soil, for upland refugia. CTSs are not known to create their own burrows, and are dependent on small mammal activity to create, maintain, and sustain sufficient underground refugia.

CTSs typically emerge from their underground refugia at night during the fall or winter rainy season (November–May) to migrate to their breeding ponds (Shaffer et al. 1993; Trenham et al. 2000). The breeding period is closely associated with rainfall patterns each year, with fewer adults migrating and breeding in drought years (Trenham et al. 2000). Male salamanders are generally first to arrive and remain in the ponds longer than females (average 44.7 days for males and 11.8 days for females) (Trenham et al. 2000). CTSs mate and lay their eggs in breeding ponds then return to upland refugia.

Breeding ponds were likely historically limited to vernal pools, but CTSs now also breed in stock ponds. Ideal breeding ponds are free of nonnative predators and fish, and are seasonal or semipermanent (Barry and Shaffer 1994). Some seasonal pools may not exhibit sufficient depth or persistence during times of drought (Barry and Shaffer 1994).

CTS larvae generally hatch within 10–24 days after egg laying, and the peak emergence of metamorphs is typically between mid-June and mid-July (Trenham et al. 2000). The larvae are completely aquatic. They feed on zooplankton, small crustaceans, and aquatic insects for about 6 weeks after hatching, after which they switch to larger prey such as larval Pacific treefrogs (*Pseudocris regilla*), western spadefoot (*Spea hammondii*), and California red-legged frogs (*Rana aurora*).

The larval stage is typically completed in 3–6 months, and most metamorphs enter upland habitat during the summer. Amphibian larvae must grow to a critical minimum body size before they can metamorphose to the terrestrial stage, and they do not survive if the breeding pond dries before metamorphosis is complete. However, larval development and metamorphosis can vary, and larvae may develop faster in smaller, more rapidly drying pools. Feaver found that larvae metamorphosed 60–94 days after eggs had been laid (Feaver 1971, in U.S. Fish and Wildlife Service 2008).

Following metamorphosis, juvenile CTSs leave their pools and move to upland habitat. This can occur in both wet and dry conditions (Loredo and Van Vuren 1996), although wet conditions are more favorable for upland travel. Under dry conditions, juveniles may remain near their natal pool, and may wait until the following winter rains to move farther into suitable upland habitat. Depending on location and other development factors, metamorphs do not return as adults to aquatic breeding habitat for 2–5 years (Trenham et al. 2000).

CTSs in Santa Barbara County have been recorded dispersing up to 1.3 miles from breeding ponds (Sweet 1998, in U.S. Fish and Wildlife Service 2008), although they typically remain close to their associated breeding ponds. One study found 95% of captured juveniles within 2,099 feet of the

breeding pond, with the remaining 5% being found at greater distances. This study also found that adult CTSs travel between ponds from year to year (Trenham et al. 2001).

Threats

Factors associated with declining CTS populations include continued habitat loss and degradation due to agriculture and urbanization; hybridization with the nonnative eastern species (*Ambystoma tigrinum*), and predation by introduced species. Habitat isolation and fragmentation within many watersheds have precluded dispersal between subpopulations. The remaining small, isolated populations are vulnerable to extirpation as a result of chance environmental or demographic events.

Status in the Plan Area

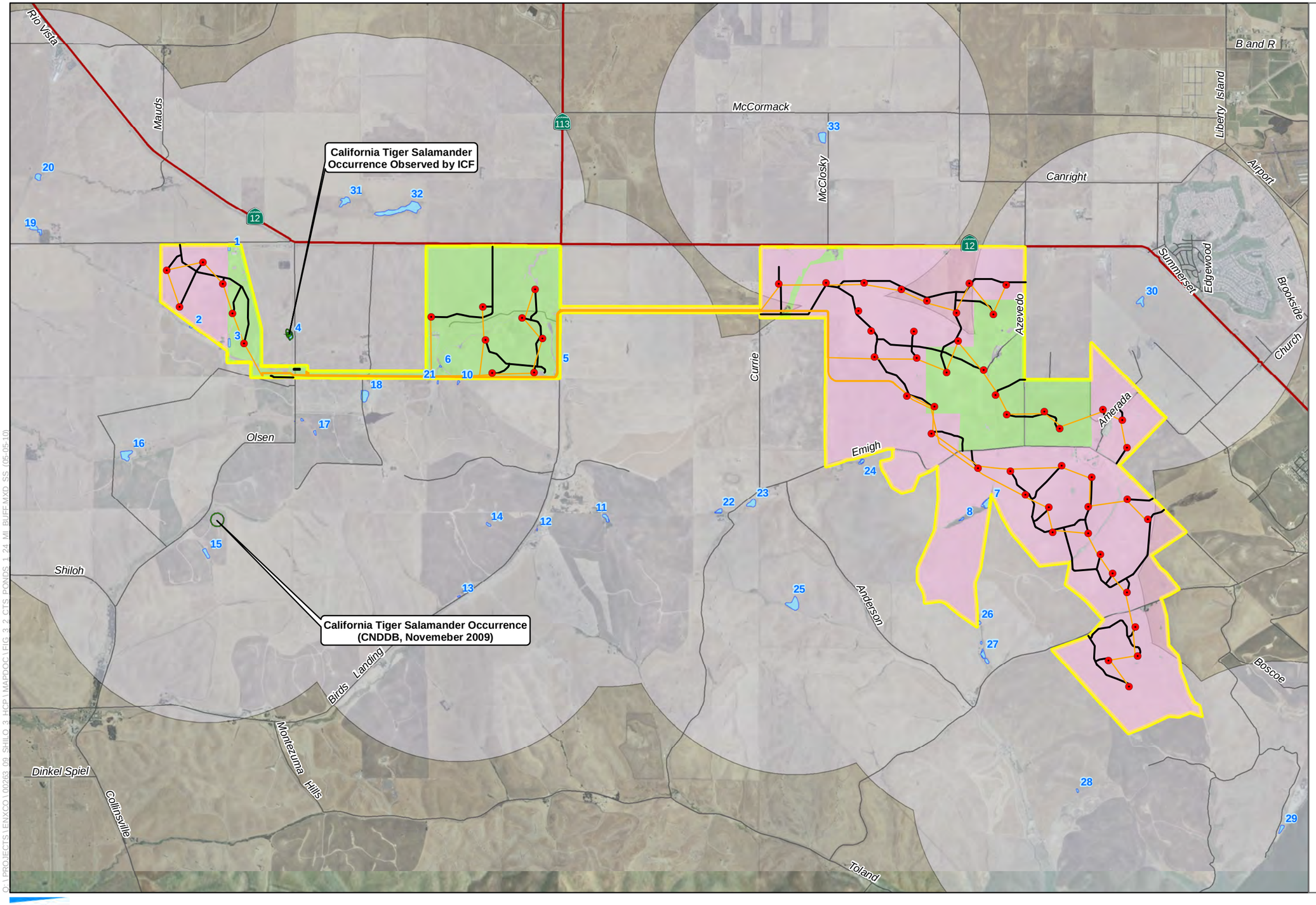
Mapping and surveys conducted by ICF in 2009 identified a total of 34 potential breeding sites (defined as sites that pond water or appear to pond water for more than 3 months of the year). Twelve of the potential breeding sites are within or immediately adjacent to the Plan Area; the remaining 22 are within a 1.24-mile radius (Figure 3-2).

Farmland in the Plan Area is typically managed on a 3-year rotation—that is, the land is planted and harvested in year one, grazed with sheep or cattle in year two, and allowed to remain fallow in year three, at which point the cycle is repeated. Areas currently mapped as grasslands are not included in these rotation cycles; however, grazing may or may not occur depending on the individual landowner's management.

Refuge habitat in the Plan Area is limited, consisting mostly of cracks in the soil, with a small number of gopher burrows along fencelines around seasonal ponds and on the dam face of ponds. There is a noticeable lack of ground squirrel burrows in the Plan Area, although a detailed burrow census was not conducted; only one ground squirrel was observed in the vicinity of the CTS survey area by ICF biologists during extensive CTS surveys over a 3-year period from 2007 to 2009. This ground squirrel was observed during the January 2009 survey along a fenceline on Montezuma Hills Road approximately 1 mile west of the Plan Area.

The California Natural Diversity Database (2009) lists one recent occurrence (2007) of an adult CTS in the Plan Area vicinity; it was found dead in a disked field within 1.25 miles of the western portion of the Plan Area and within 0.25 mile of stock pond 15 (Figure 3-2). Additionally, biologist Stephanie Myers, conducting independent field surveys, observed a CTS larva on May 8, 2009, in pond 4, a seasonal pond near the corner of Olsen Road and SR 12, approximately 0.25 mile from the Plan Area boundary. In a 4- to 10-mile radius there are another 18 occurrences to the north (Jepson Prairie), four occurrences to the northwest (Portrero Hills), and one occurrence to the south (Figure 3-1). SR 12 may present some impediment to movement as a result of traffic and new drains added on the shoulder of the road. Suisun Marsh and the railroad are potential barriers between the Plan Area and occurrences to the north and northwest. The Sacramento and San Joaquin Rivers are impassable barriers between the Plan Area and occurrences south of it.

As the first step in reaching a determination on the presence of CTS in the plan area, a site assessment (ICF Jones & Stokes 2009) was conducted in accordance with the procedures set forth in *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (U.S. Fish and Wildlife Service and California Department of Fish and Game 2003) (interim guidance). The interim guidance describes two components to the



Legend

- Proposed Turbine Location
- Proposed Road
- Electrical Collection Line
- Shiloh III Project Area
- Agriculture
- Annual Grassland
- Aquatic Habitat
- 1.24 Mile Buffer around Ponds
- Major Roads
- County Road

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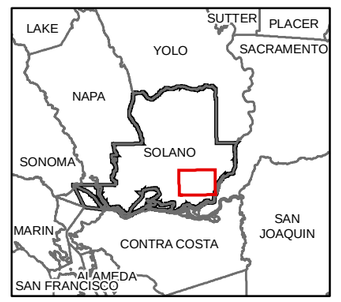
Miles



Base Map: ESRI Stream Imagery, iCubed 2009

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Figure 3-2
California Tiger Salamander Habitat in the Project Vicinity

assessment process: an assessment of potential habitat and documented CTS occurrences in and around the project site, and protocol-level field surveys of breeding pools and associated uplands to determine presence or absence.

The site assessment indicated that there are potential breeding sites (ponds) in the Plan Area and within 1.24 miles of the Plan Area. Upland habitat in the project vicinity is mostly cultivated agricultural lands, with small areas of relatively undisturbed habitat surrounding ponds, wetlands, and roads. Burrows, necessary for CTS underground refugia, are limited because ground squirrels and other burrowing animals have nearly been eliminated from the Montezuma Hills area by farming and ranching activities. Because soils in the area are primarily clays, they are prone to extensive shrinking and swelling, creating deep crevices during part of the year. CTS have been observed using these types of soil crevices in other locations, although such crevices may not be a reliable source of cover because they are prone to shrinkage during the fall and winter months, possibly entombing resident salamanders. Despite these conditions, and in view of the two observations described above, CTS could be present in suitable upland habitat within 1.24 miles of suitable breeding ponds and could disperse into agricultural lands. This distance is based on observed mobility of the species as described in USFWS and DFG interim guidance.

Based on the results of the site assessment and in consideration of these occurrences, USFWS recommended that surveys for CTS be conducted only in the eastern portion of the Plan Area (the area roughly to the east of Birds Landing Road), assuming presence in the western portion of the Plan Area (Tovar pers. comm.). ICF biologists conducted surveys in accordance with the interim guidelines in spring 2009, winter 2009/2010, and spring 2010 in suitable aquatic and upland habitat in the eastern portion of the Plan Area. Protocol-level surveys were completed May 4, 2010, and no CTS were found.

Chapter 4
Impact Assessment

4.1 Project-Specific Impacts

The covered activities may result in adverse effects on CTS. Impacts such as habitat loss, degradation, or fragmentation; direct mortality; injury; and harassment of individual juveniles and adults could result from construction-related activities or vehicle strikes. As shown in Figure 3-1, there is no designated critical habitat in the Plan Area or its vicinity; consequently, the covered activities would not affect critical habitat. Potential impacts are described below.

4.1.1 Habitat Loss

As discussed in greater detail in Chapter 5, *Conservation Strategy*, no seasonal wetlands or ponds appropriate for salamander breeding would be directly affected by the covered activities. Only upland habitat, consisting of grasslands and agricultural lands, would be affected. The grasslands provide potential habitat for foraging, cover, shelter, and dispersal. The agricultural lands provide dispersal habitat, but have limited value for salamander foraging and cover when in agricultural production, since disking destroys burrows and crevices.

Permanent and temporary habitat impacts were calculated using the assumptions listed below.

Permanent Impacts

- **Wind turbine foundations.** A 92-foot-diameter permanent impact area would result from the concrete foundation (24 feet in diameter) and additional graveled area surrounding each turbine (a 34-foot radius from the foundation perimeter).
- **Roads.** Each new road would entail a 16-foot-wide corridor of permanent impact.
- **Substation.** The designated area would constitute an area of permanent impact.
- **Transmission line.** Construction of a new 0.25-mile transmission line, including approximately five tower footings and approximately three pole footings, would be associated with selection of the Option 2 substation location.

Temporary Impacts

- **Wind turbine sites.** Temporary disturbance to a distance of 42 feet beyond the permanent impact area would result from turbine installation.
- **Laydown areas.** Temporary impacts would occur within designated areas.
- **Roads.** An additional 34 feet of temporary impacts (17 feet on either side of the permanent impact area) would result from road construction activities and transporting turbines.
- **Collection lines.** Installation of collection lines would result in a temporary disturbance corridor 20 feet wide.

- **Maintenance.** Additional temporary impacts would result from wind turbine repair or replacement, electrical line repair or maintenance, and road maintenance. Such activities would be undertaken only on an as-needed basis—typically, individual turbines need major repair or replacement every 5–10 years, requiring several days of activity.

Figure 4-1 illustrates these spatial assumptions. Figure 2-3 depicts the impacts of the proposed project throughout the Plan Area.

The initial construction phase would result in the permanent loss of 15 acres of grassland and 36 acres of agricultural land from construction and placement of wind turbines, substation, switch yard, and permanent roads. Temporary impacts on 65 acres of grassland and 110 acres of agricultural land would result from installation of collection lines, a construction area around each turbine pad, temporary equipment access, and temporary laydown areas.

In addition to temporary habitat loss incurred during the construction phase, land may be temporarily disturbed by maintenance activities over the permit term. Wind turbines may need to be repaired or replaced, at a rate of approximately one turbine/5 years, for replacement of a total of approximately six turbines over the 30-year lease period. Based on an estimated 1.8-acre disturbance area for each turbine replacement, approximately 10.8 acres (6 x 1.8 acres) would be temporarily disturbed for wind turbine replacement. Other potential maintenance activities include road repair and reapplication of gravel. Portions of underground transmission lines may need to be replaced (approximately 1 mile over the permit term), for a total of up to 2.5 acres of temporary impacts. A total of up to 15 acres of land may be temporarily disturbed: up to 5 acres of grassland and 10 acres of agricultural land (assuming one-third of the impact is on grassland and two-thirds on agricultural land) (these impact acreages are approximate because maintenance activities are unknown until they become necessary). No permanent habitat loss is expected from maintenance activities, and temporary disturbance would occur primarily in the ground-disturbance footprint associated with project construction. All habitat temporarily disturbed during maintenance would be returned to preproject conditions within 1 year of disturbance.

Loss of grasslands would affect CTS by decreasing the area available for foraging, cover, and shelter. However, 70 acres of the grasslands to be temporarily lost (65 acres during construction and up to 5 acres for maintenance activities) and would be restored within 1 year of impact. 15 acres of grasslands would be permanently lost from construction of project facilities. This is 1.1% of the total grasslands currently available to the species in the Plan Area. A small percentage of the habitat in the Plan Area would be affected by the proposed project, as shown in Table 4-1.

Table 4-1. Impacts on Agriculture and Grasslands

Land Cover Type	Acres in Plan Area	Impact Type	Impact Acres	% of Specific Land Cover Type in Plan Area
Agriculture	3,116	Permanent	36	1.2
		Temporary: construction	110	3.5
		Temporary: maintenance	10	0.3
Grassland	1,346	Permanent	15	1.1
		Temporary: construction	65	4.8
		Temporary: maintenance	5	0.4

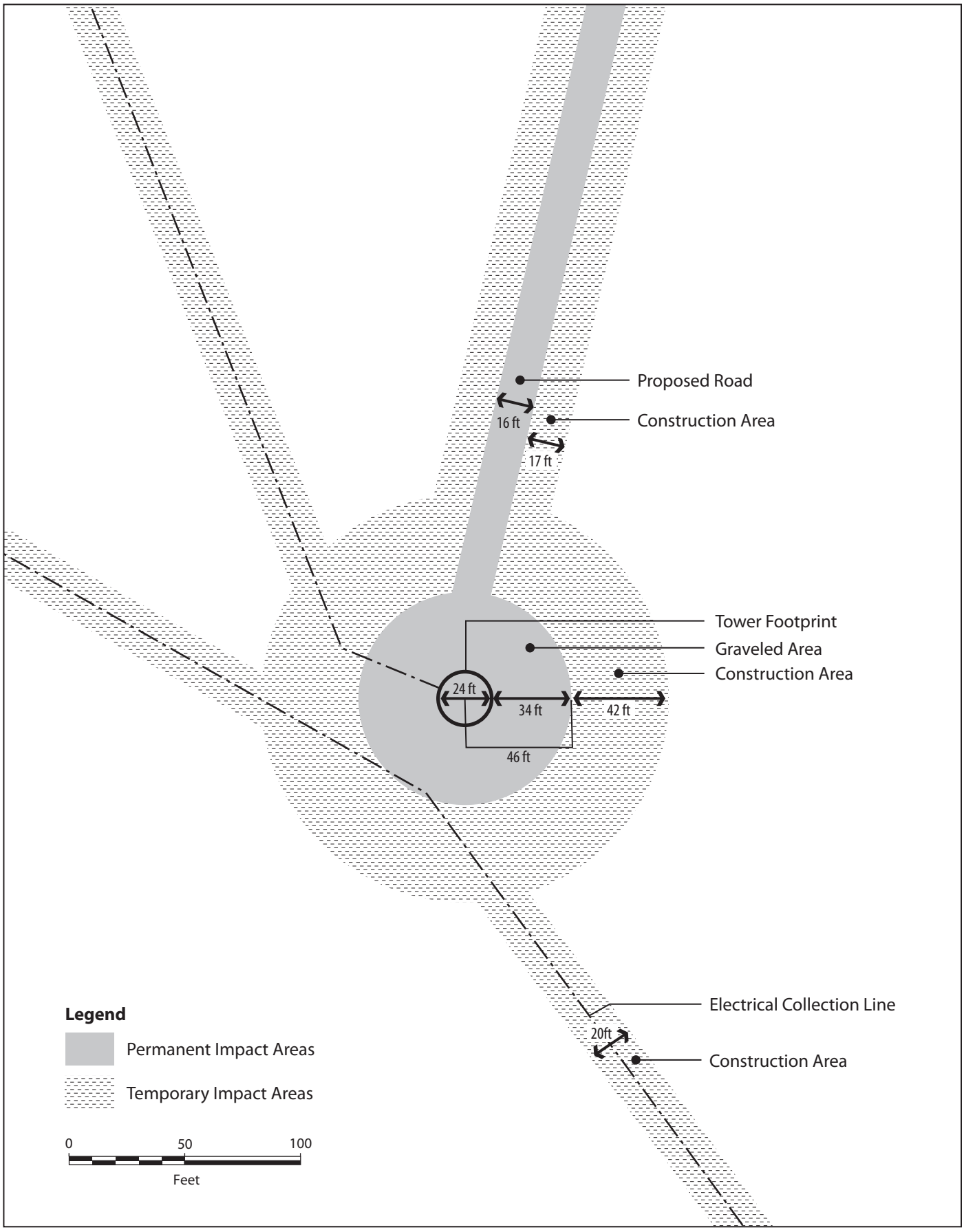

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Figure 4-1
Impact Analysis Schematic

Permanent grassland effects are associated with graveled roads (10 acres), the substation (2 acres), and the graveled areas around the bases of turbines (3 acres). Temporary grassland effects are associated with collection lines (29 acres), construction areas (7 acres), laydown areas (6 acres), and access roads (23 acres).

Loss of both grasslands and agricultural land could affect CTS dispersal. As described above, the agricultural lands have limited value for the species' cover and foraging requirements. Habitat degradation and fragmentation are further described below.

4.1.2 Habitat Degradation

Upland habitat provides foraging, cover, shelter, and dispersal opportunities for CTS. In addition, uplands support the hydrologic functioning of aquatic habitats by maximizing inundation periods; they also help to preserve water quality by minimizing the entry of sediments and other contaminants into aquatic habitats. Upland impacts resulting from the proposed project could potentially indirectly degrade nearby aquatic habitats by altering hydrology and water quality in the local watershed.

Figure 3-2 shows dispersal distances, land cover, and facilities near aquatic habitat features within and adjacent to the Plan Area. Because of the small impact footprint in relation to the size of each watershed, the Proposed Project is not expected to significantly alter the extent of impervious surface that could otherwise alter the hydrology. Implementation of avoidance and minimization measures described in Chapter 5, *Conservation Strategy*, would ensure that the proposed project does not directly or indirectly contribute any sediments or other pollutants that would adversely affect aquatic habitat for CTS.

Access roads could degrade dispersal habitat by introducing different land cover types that salamanders would need to cross, resulting in possible increased exposure to predators. CTS mortality and injury occur when individuals attempt to cross roads and are hit by vehicles; accordingly, access roads associated with the proposed project may pose a threat to CTSs. CTS vehicle strikes are most likely to occur on rainy nights when the animals are moving to their breeding ponds; since the project-related access roads will seldom be traveled on rainy nights, the risk of vehicle strikes is not high.

When the turbines are operational, noise levels will be elevated over existing conditions. Studies of the effects of sound on other wildlife species have indicated that noise can cause alterations in behavior patterns. Studies on amphibians have mostly focused on vocalization and call detection by frogs. Noise can affect spacing and degree of aggregation of calling males frogs and it can also affect the emergence of spadefoot toads at times when water is not present. Increases in noise levels are not expected to affect CTS because they are primarily driven by temperature, moisture, and olfactory cues.

Habitat degradation resulting from water quality effects is expected to be negligible because of measures to protect water quality; habitat degradation resulting from new roads is expected to be low because of the small area affected by roads and because of their infrequent use during the rainy season; and habitat degradation resulting from turbine noise is also expected to be low because CTS respond to temperature, moisture, and olfactory cues.

Habitat degradation to could also occur if HDD activities result in migration of the bentonite (an inert and non-toxic clay material) and water drilling solution to surface wetlands (i.e., *frac-out*).

enXco has directionally drilled thousands of feet of similar collection lines in dozens of locations in the area, and less than approximately 5% of these drilling operations have resulted in frac-outs. Therefore, a frac-out is possible, but the likelihood is low. If a frac-out occurs, drilling is slowed and stopped until containment measures can be put in place; when drilling is complete surface fluids are collected and disposed of in existing trenches or the landfill. Because no directional drilling is proposed under ponds, a frac-out in water is unlikely; however, directional drilling would be conducted under seasonal wetlands and an alkali meadow, and indirect effects could occur in two ponds that are downgradient if the area is not adequately contained and cleaned. Vernal pools are upgradient and would be unaffected. Other sensitive resources are not expected to be adversely affected because of the low probability of species occurrence in an area of frac-out, containment, and mitigation measures.

Habitat degradation in agricultural lands resulting from temporary and permanent effects is expected to be minimal for CTS. While some agricultural lands may provide dispersal habitat, they have limited value for salamander foraging and cover when in agricultural production, since disking occurs on a regular basis (every 2 or 3 years), destroying burrows and crevices. There is a noticeable scarcity of burrows in the agricultural lands. The surveys of the ponds on the eastern half of the Plan Area over the past 2 years indicate that CTSs do not currently inhabit these ponds, making dispersal from or use of these ponds unlikely. Other ponds that are south of the Plan Area have not been sampled, though the majority of these are also surrounded by cultivated agricultural land.

4.1.3 Habitat Fragmentation

Studies suggest that the current patchy distribution of CTS was caused by a combination of the extreme anthropogenic changes in and around the Central Valley and the restrictive breeding requirements of the species. The threat of additional fragmentation resulting from urban development and conversion to more intensive agriculture is one of the primary factors leading to the listing of the species (U.S. Fish and Wildlife Service 2004).

Land conversion could create barriers to the dispersal of CTSs between breeding sites and upland habitat and between breeding areas. The nearest breeding populations are in Contra Costa County between Concord and Antioch, south of the Plan Area, and in the vicinity of Travis Air Force Base, north of the Plan Area (Jepson Prairie Critical Habitat Unit). The Contra Costa County population is separated from the Plan Area by the San Joaquin–Sacramento River complex, while the Jepson Prairie population is approximately 4 miles north and separated from the Plan Area by SR 12. While it is possible that CTS disperse across SR 12, it is unlikely that they would do so in large enough numbers to significantly affect breeding populations, given the high number of vehicles and potential for mortality on the road. The proposed project would not impede genetic exchange between known breeding populations.

There are presently no topographic or other physical barriers that limit salamander dispersal throughout the Plan Area. The proposed project would not introduce substantial barriers to movement between habitat components in and near the Plan Area. Only a small proportion of dispersal habitat in the Plan Area would be lost and wind turbine spacing would not interfere with CTS movement through the site. The permanent roads would be 16 feet wide and infrequently travelled by vehicles and would not pose a barrier to salamander dispersal. The wind turbines would not impede CTS movement between aquatic habitat areas or between aquatic habitat and surrounding uplands; moreover, avoidance and minimization measures described in Chapter 5,

Conservation Strategy, would ensure that suitable habitat is avoided or that compensatory mitigation is provided.

In light of the analyses above, the proposed project would neither impede regional movement between CTS populations, nor introduce barriers between aquatic habitat and upland habitat areas within the Plan Area. It would not isolate, fragment, or create barriers to dispersal between any known or potentially occupied CTS habitat.

4.1.4 Construction-Related Impacts

Mortality, injury, or harassment of CTS could result from project-related equipment or vehicles, construction debris, and worker foot traffic within the Plan Area. Individuals could fall into trenches, pits, or other excavations and be directly killed or, unable to escape, be killed by desiccation, entombment, or starvation. Disturbance and displacement associated with work activities may increase the potential for predation, desiccation, competition for food and shelter, or strike by vehicles on access roads.

Construction activities could result in the introduction of chemical contaminants to the site. Vehicles may leak hazardous substances such as motor oil and antifreeze. A variety of substances could be introduced during accidental spills of materials. Such spills can result from leaks in vehicles, small containers falling off vehicles, or accidents resulting in whole loads being spilled. Large spills may be partially or completely alleviated by clean-up efforts, depending on the substance. CTSs using these areas could be exposed to any contaminants that are present at the site. Exposure pathways could include inhalation, dermal contact, or direct ingestion. Exposure to contaminants can cause chronic or acute effects that could impair health and/or productivity or lead to mortality. Carcinogenic substances could cause genetic damage resulting in sterility, reduced productivity, or reduced fitness of progeny. Little information is available on the effects of contaminants on CTS. The effects may be difficult to detect. Morbidity or mortality would likely occur after the animals had left the contaminated site, and more subtle effects, such as genetic damage, could only be detected through intensive study and monitoring.

Construction vehicles parked in tall grasslands under dry conditions, as well as construction crew staff improperly extinguishing and disposing of their cigarettes, could accidentally cause a grassland fire during dry conditions. This impact mechanism is unlikely given past experience with wind farm development in the Montezuma Hills; moreover, potential effects will be minimized with development and implementation of a fire prevention and response plan as required by the County. Should wildfire occur, it would likely occur during the inactive period when CTSs are aestivating underground; direct mortality would be minimal, and grasslands would recover the following wet season.

Based on the presence of grassland habitat in the central and western portions of the Plan Area and the observation of CTS in Pond 4 (Figure 3-2), CTSs are expected to occur in this portion of the Plan Area. While the grassland habitat in the eastern portion of the Plan Area also provides potential upland habitat, no CTSs were found during protocol-level surveys, and CTSs are not expected to occur. CTSs could also be found dispersing across agricultural land. In sum, the likelihood of injuring CTSs during construction is low. Impact avoidance and minimization measures described in Chapter 5 *Conservation Strategy*, will further reduce the likelihood of injuring CTSs during construction.

4.2 Cumulative Impacts

A number of ongoing and proposed projects could contribute to adverse effects on CTS habitat within Solano County. These activities may alter aquatic and upland habitats and could potentially harass, harm, injure, or kill CTSs. Activities that would potentially affect CTS include development associated with urban, water, flood control, highway/roadway, and utility projects; application of herbicides/pesticides; conversion to agricultural use; and indirect effects of adjacent development such as urban runoff altering the hydrologic regime.

CTS habitat in Solano County may be lost or degraded as a result of road and utility construction and maintenance, overgrazing, agricultural expansion, and water irrigation and storage projects. Other threats include contamination, poisoning, increased predation, competition from nonnative species, residential development, small mammal population control, and mosquito control.

Cattle grazing is a common land use practice in rural Solano County. Overgrazing can result in degradation and loss of riparian vegetation, increased water temperatures, streambank and upland erosion, and decreased water quality in streams. Livestock operations also degrade water quality with pesticides and nutrient contamination. However, light to moderate livestock grazing is generally thought to be compatible with continued successful use of rangelands by CTS, provided the grazed areas are not subject to intensive burrowing rodent control efforts (Shaffer et al. 1993; U.S. Fish and Wildlife Service 2008). The shorter vegetation associated with grazed areas may make the habitat more suitable for ground squirrels, whose burrows are utilized by CTSs for refugia (U.S. Fish and Wildlife Service 2008).

Agricultural development, impoundments, and irrigation can alter vernal pool hydrology, resulting in the loss of aquatic breeding habitat. Disking, a common practice on agricultural lands, can result in substantial losses of upland habitat for CTS. Significant amounts of rural, undeveloped land are currently being converted to agricultural land in Solano County, resulting in loss of upland habitat for listed species (U.S. Fish and Wildlife Service 2008). Moreover, agricultural development in the Montezuma Hills has substantially reduced remaining suitable habitat in this area; roads associated with wind project development have also contributed to the loss of habitat.

The project upgrades would connect the Interstate-80/Leisure Town Road interchange in Vacaville with SR 12 in Suisun City. Current development activities under Solano County's jurisdiction include proposed expansion of the Potrero Hills Landfill and additional wind energy/turbines in the Montezuma Hills WRA. Expansion of the Potrero Hill Landfill would affect approximately 245 acres of primarily upland habitat that is inhabited by CTS (U.S. Fish and Wildlife Service 2008).

The SR 12 corridor in the Fairfield–Suisun–Rio Vista area has experienced rapid growth over the last several decades. The Association of Bay Area Governments (ABAG) anticipates continued growth of both population and jobs through 2020. The California Department of Finance project that Solano County's population will increase from 339,000 in 2000 to 564,000 by 2020, with most growth occurring within the County's three largest cities: Vallejo, Fairfield, and Vacaville. Rio Vista, while still a relatively small community, has led Solano County growth (in terms of percentage growth rate) for the last few years (U.S. Fish and Wildlife Service 2008). Increased demand for housing will likely result in loss of suitable CTS habitat as housing developments replace agricultural and ranch lands. Increased urbanization in the region will contribute to the degradation of water quality in streams, altered flow regimes, increased contaminated road runoff, loss of upland habitat, and increased human presence in natural areas. Improvements currently in progress on SR 12 include

shoulder widening, centerline soft median barrier, left-turn channelization, drainage modifications, intersection widening, alignment improvements, and pavement and rehabilitation of existing roadway surfaces.

Cumulative effects on CTS include continuing and future loss of suitable breeding, foraging, sheltering, and dispersal habitat resulting from conversion to urban development. Additional urbanization can stimulate road widening projects and generate increased traffic on roads that bisect habitat, thereby increasing road-kill while reducing and further fragmenting remaining habitat. CTSs are likely exposed to a variety of pesticides and other chemicals throughout their range. Hydrocarbon and other contamination from oil production and road runoff; the application of numerous chemicals for roadside maintenance; urban/suburban landscape maintenance; and rodent and vector control programs may all have adverse effects on CTS populations.

Further habitat fragmentation, additional nonnative species introduction, and increased access to aquatic habitat could facilitate or increase the spread of amphibian diseases within the range of the CTS. The global mass extinction of amphibians primarily attributable to chytrid fungus is of significant concern to USFWS (U.S. Fish and Wildlife Service 2008).

The global average temperature has risen by approximately 0.6°C during the twentieth century. Ongoing climate change may threaten CTS and the resources necessary for the species' survival. Because climate change threatens to disrupt annual weather patterns, it may result in a loss of suitable habitats and/or prey, and/or increased numbers of their predators, parasites, and diseases (U.S. Fish and Wildlife Service 2008).

4.3 Impacts with Respect to Survival and Recovery

A recovery plan has not been prepared for CTS. However, when designating critical habitat for CTS, USFWS determined that conserving the central population over the long term requires a five-pronged approach (70 FR 49379–49458) as shown below.

1. Maintaining the current genetic structure across the species range.
2. Maintaining the current geographic, elevational, and ecological distribution.
3. Protecting the hydrology and water quality of breeding pools and ponds.
4. Retaining or providing for connectivity between breeding locations for genetic exchange and recolonization.
5. Protecting sufficient barrier-free upland habitat around each breeding location to allow for sufficient survival and recruitment to maintain a breeding population over the long term.

The proposed project is expected to result in few CTS mortalities and in small and unlikely indirect effects on aquatic habitat; it would therefore not diminish the current genetic structure throughout the species' range, nor would it diminish the species' current geographic, elevational, or ecological distribution. As described in Section 5.1.3, the proposed project would retain connectivity between potential breeding locations to allow for genetic exchange and recolonization. By retaining approximately 99% of the upland habitat in the Plan Area, the proposed project would not appreciably reduce upland areas surrounding breeding habitat. Most of the permanent impacts would occur on agricultural lands that do not provide habitat values for the species other than for dispersal, and the grasslands to be permanently affected have a scarcity of burrows. Furthermore,

measures will be implemented as described in Chapter 5, *Conservation Strategy*, to minimize impacts and to mitigate the permanent loss of habitat through offsite preservation and management of high-quality occupied habitat. Considering both the effects of the Proposed Project and cumulative impacts on the species, the Proposed Project would not preclude the survival or recovery of the central population of CTS.

Chapter 5
Conservation Strategy

This chapter describes the conservation strategy that the permittees will implement to minimize and mitigate impacts on CTS as required under Section 10(a)(2)(B) of the ESA. This strategy is consistent with USFWS's "Five-Point Policy" (65 FR 35242), an addendum to USFWS's 1996 HCP Handbook, which provides guidance on biological goals and objectives, monitoring, and adaptive management for incorporation into HCPs.

5.1 Biological Goal

In the context of HCPs, biological goals form the guiding principle behind the operating conservation program. The biological goal of this HCP is to provide the continuing protection and existence of CTS in Solano County by purchasing mitigation credits at a USFWS- and DFG-approved conservation bank in Solano County.

5.2 Conservation Approach

The conservation approach described in this section comprises avoidance and minimization measures and compensatory mitigation.

5.2.1 Avoidance and Minimization

Minimize Impact Area

- All covered activities will maintain a minimum distance of 250 feet from suitable CTS aquatic habitat as identified in the site assessment (i.e., specific ponds and vernal pools). Work areas will be flagged or otherwise marked, and no disturbance will occur outside these areas.
- Access routes, staging areas, and road-building activities will be limited to the minimum extent necessary. The main access roads will generally be limited to dirt and/or gravel and compacted roadside shoulders.

Avoid Injury of Salamanders during Implementation of Covered Activities

- If CTSs are found within the work area during the course of the project, USFWS and DFG will be immediately notified. The USFWS- and DFG-approved biologist will move individual salamanders and release them into nearby active Botta pocket gopher or
- California ground squirrel burrows that are outside the areas of disturbance.
- Work within 0.5 mile of aquatic CTS habitat will be limited to the dry season (April 15–October 15; the period can be extended depending upon the onset or cessation of rains). Work may take place during the wet season in areas at least 0.5 mile from aquatic CTS habitat, but such wet season work will be minimized to the extent possible.

- If work is to occur during the rainy season (characterized by the first significant rainfall amount of 0.25 inch of rain within a 24-hour period), temporary ramps will be installed in open trenches, and a monitor will inspect each trench before construction starts each day.
- All vehicles and project equipment will not exceed a 15 miles per hour (mph) speed limit.
- All trenches will be covered overnight with boards or metal plates placed flush to the ground.
- All work will be conducted between sunrise and sunset.
- No pets will be allowed on the project site during construction.
- All foods and food-related trash items will be enclosed in sealed trash containers at the end of each day and removed from the site every day.

Avoid Habitat Impacts Associated with Erosion and Sedimentation Generated by Covered Activities

- Standard erosion and sediment control measures and best management practices (BMPs) will be identified in a Storm Water Pollution Prevention Plan (SWPPP) and will be implemented during construction; no plastic mesh will be used. Typical measures specify installation of silt fencing, parameters governing refueling activities, and so on.
- The SWPPP contractor will provide a draft of the SWPPP to the biological monitor, who will review the SWPPP and provide input to ensure that the SWPPP adequately protects CTS habitat in the vicinity of the covered activities from adverse erosion and sedimentation effects. The SWPPP contractor and biological monitor will coordinate throughout project construction to ensure that erosion and sedimentation control measures protecting CTS habitat are adequately implemented in accordance with the SWPPP.
- The potential for significant losses of drilling fluids into the environment will be minimized through several measures. Prior to drilling, the geological characteristics of the site will be evaluated so that the most appropriate route for the conduit installation can be determined. During drilling, the loss of drilling fluids to the formation would be assessed by monitoring returns of the drilling fluid to the entry point or changes in the pressure of the drilling fluid. If a loss of fluid volume or pressure is detected, drilling may be stopped or slowed to allow close observation for a surface release. If a release is discovered, the driller would take feasible measures to reduce the quantity of fluid released by lowering drilling fluid pressures and/or thickening the drilling fluid. However, the appropriate response depends on geologic conditions. Any surface releases would be contained with sand bags and sediment fences and collected for reuse or disposal.

Minimize the Risk of Project-Related Toxic Spills that Could Adversely Affect California Tiger Salamanders or Their Habitat

- All equipment will be maintained to ensure that there will be no leaks of automotive fluids (e.g., gasoline, oils, solvents).
- Any hazardous materials such as fuels, oils, and solvents will be stored in sealable containers in designated locations at least 250 feet from aquatic habitat. Maintenance of vehicles and other equipment (if necessary) and establishment of staging areas will take place at least 250 feet from any aquatic habitat.

Restore All Temporarily Disturbed California Tiger Salamander Habitat in the Plan Area to Preproject Conditions within 1 Year of Disturbance

- Following construction, enXco will remove all construction debris (including protective fencing, barriers, flagging, and steel plating) and reseed each site with the erosion control seed mix provided in Appendix C.
- enXco will implement the grassland restoration plan described in Appendix C of this HCP.

Ensure Implementation of the Conservation Measures

- enXco will designate a Superintendent or other designee who will be responsible for implementing the conservation measures in the HCP and the terms of the ITP. The Superintendent will maintain a copy of this HCP and the ITP onsite whenever construction is taking place. The Superintendent's name and telephone number will be provided to USFWS and DFG at least 30 calendar days prior to project groundbreaking.
- An experienced qualified biological monitor (approved by USFWS and DFG) will be onsite during construction throughout the duration or construction activities. The monitor will have the authority to stop work. Any monitoring activities potentially resulting in harassment of CTS will be performed by a biologist with a current 10(a)1(A) permit for CTS.
- The biological monitor will conduct environmental awareness training for all onsite project personnel prior to the commencement of work.

5.2.2 Mitigation

Offset Unavoidable Permanent Habitat Impacts on California Tiger Salamander through Habitat Conservation at a USFWS- and DFG-Approved Conservation Bank

To mitigate unavoidable impacts on 15 acres of CTS upland habitat (grassland with a scarcity of burrows and surrounded by agricultural lands), enXco will permanently protect a total of 45 acres of high-quality occupied upland habitat (15 acres of permanent impact on grassland habitat at a 3:1 ratio = 45 acres of preservation) in an area with high long-term conservation value for the species. This habitat compensation will be achieved through the purchase of compensation credits at an existing USFWS- and DFG-approved bank or banks, as appropriate for the species in Solano County. Approved banks will have sufficient reserves or contingency funds to address changed circumstances that arise, and multiple species credits may be purchased to benefit other species.

Additionally, temporary grassland impact areas that are not restored within 1 year of disturbance but are restored within 2 years of disturbance will be mitigated offsite at a 1.1:1 ratio at an approved bank to account for temporal loss. An additional 5 acres is assumed to need additional restoration time and will therefore be mitigated offsite at a 1.1:1 ratio up front (an additional 5.5 acres of dispersal habitat will be provided up front, or an equivalent financial amount to secure breeding habitat, with agency concurrence). Any disturbed areas above the 5 acres that are not restored within 2 years will be considered permanently affected, and will be mitigated offsite at an approved bank at a 3:1 ratio.

The likelihood of take of CTS as a result of temporary or permanent effects on agricultural land, is extremely low. enXco is not proposing to mitigate temporary or permanent effects on agricultural

land because it will not be altering CTSs' ability to disperse across the area, because these cultivated lands provide low-quality habitat for CTS due to lack of burrows and soil characteristics, and because CTS surveys indicate the ponds within the Plan Area are not occupied. However, enXco is seeking take authorization in its activities in agricultural areas for the remote possibility that take of individuals during construction or operation does occur; moreover, enXco is providing mitigation for temporary and permanent effects on all grassland in the Plan Area, including the eastern half of the Plan Area nearest the unoccupied ponds.

5.3 Monitoring and Adaptive Management

5.3.1 Monitoring

The Five-Point Policy (U.S. Fish and Wildlife Service 2000) addresses requirements for the HCP monitoring program, which should provide information to (1) evaluate compliance, (2) determine if biological goals and objectives are being met, and (3) provide feedback information for an adaptive management strategy. The Five-Point Policy describes compliance monitoring and effects and effectiveness monitoring.

Compliance monitoring involves verifying that the permittees are carrying out the terms of the HCP. As described in Section 5.2.1, a biological monitor will be present during construction activities and any maintenance activities that involve ground disturbance to ensure that construction personnel adhere to the specified impact avoidance and minimization measures. This and additional monitoring to ensure that the conservation measures are implemented are described in Chapter 8, *Plan Implementation*.

Effects and effectiveness monitoring evaluates the effects of the permitted action and determines whether the operating conservation program is meeting its biological goals. This HCP is habitat based, and effects are accordingly measured on the basis of habitat impacts. Effects and effectiveness monitoring will include a postconstruction evaluation to assess the actual acreage affected, as well as a series of evaluations to assess habitat restoration success (Appendix C).

5.3.2 Adaptive Management

USFWS broadly defines *adaptive management* as a method for examining alternative strategies for meeting measurable biological goals and objectives, and then, if necessary, adjusting future conservation management actions according to what is learned. USFWS believes that either active or passive adaptive management can be appropriately applied to HCPs. Active adaptation involves testing a range of alternative strategies, whereas passive adaptation uses information gathered to determine the single best course of action (U.S. Fish and Wildlife Service 2000). This HCP employs passive adaptive management, because mitigation will be occurring at an approved bank.

Adaptive management will be applied to the habitat restoration program. As described further in Appendix C, temporarily affected areas will be restored and monitored. If monitoring indicates that restoration performance standards are not being met, areas will be re-seeded and/or other remedial measures will be implemented to ensure restoration success.

5.3.3 Reporting

Reporting under the monitoring and adaptive management program will adhere to the requirements listed below.

- Monthly emails will be sent to USWFS and DFG prior to and during construction confirming that avoidance and minimization measures are being implemented and indicating if any issues have arisen regarding CTS (e.g., frac-outs).
- USFWS and DFG will be immediately notified if CTS are discovered onsite or if an individual mortality occurs.
- A postconstruction report will be submitted to USFWS and DFG within 60 days following completion of construction. The report will include a summary of conservation measures implemented prior to and during construction, success of these measures, and actual temporary and permanent impact acreages. A similar report will be submitted to USFWS and DFG within 60 days of completion of any subsequent maintenance activities requiring ground disturbance.
- enXco will submit restoration monitoring reports to USFWS and DFG in the year following ground-disturbing activities as stipulated in the grassland restoration plan (Appendix C).

5.4 Summary of Conservation Strategy

In summary, the conservation strategy consists of measures that minimize habitat disturbance and avoid injury to CTSs, restore temporarily affected habitat areas, and mitigate permanent unavoidable impacts through offsite conservation at a 3:1 ratio. In view of the following considerations, it is possible that lower mitigation ratios than those proposed would be appropriate for the level of impacts anticipated; nevertheless, the permittees proposed implementing compensatory mitigation at the customary 3:1 ratio. The habitat to be affected in the eastern portion of the Plan Area appears to be minimally used based on the lack of observations during 2 years of onsite surveys; the western portions of the Plan Area likely support a low density of CTSs due to surrounding agricultural lands and a scarcity of burrows. Covered activities would not preclude or disrupt important connectivity within or between CTS populations: the Plan Area is not in a key habitat connection for the species, and the covered activities will not preclude movement between aquatic habitat and surrounding upland areas because the development activities, unlike urban development, are widely dispersed and of low intensity. Moreover, suitable aquatic habitat will be avoided. In addition, wind energy development in this area will maintain the land in relative open space for the approximately 30-year life of the project and will prevent future rezoning and possible more intensive development from occurring during that period. The lands to be conserved and managed offsite will be within a large, contiguous habitat block within a core population for the species, and will have high long-term conservation value for the species, thereby fully offsetting unavoidable impacts on habitat.

Chapter 6
Plan Implementation

6.1 Responsible Parties

This section of the HCP describes the responsibilities of each party involved in implementation of the HCP.

6.1.1 Permittees

The permittees will be responsible for implementing the conservation measures described in Chapter 5. The permittees will track and document compliance with the conservation measures and will be responsible for preparing compliance reports to be submitted to USFWS and DFG as described in Section 6.2. PG&E will track and document compliance with the conservation measures associated with the interconnection and will either submit this information to enXco for enXco to integrate into its reporting, or will submit information directly to USFWS and DFG.

6.1.2 U.S. Fish and Wildlife Service

USFWS will receive monitoring reports submitted by the permittees and will have an opportunity to review and comment on these reports. If USFWS determines upon review of monitoring reports that the permittees are not in compliance with the terms of the HCP, it is USFWS's responsibility to inform the permittees of their responsibility to bring conservation activities back into compliance with the HCP.

6.1.3 California Department of Fish and Game

DFG is not explicitly a party to the HCP; however, enXco is pursuing a take permit under the California Endangered Species Act and Section 2081 of the Fish and Game Code that will mirror the commitments and obligations in this HCP. Accordingly, enXco will also be reporting to DFG.

6.2 Compliance Monitoring and Reporting

The permittees will submit to USFWS and DFG compliance monitoring and reporting consistent with Section 5.3.3.

Chapter 7
Funding and Assurances

7.1 Funding

The ESA and its implementing regulations (50 CFR 17 and 222) require that HCPs specify the measures the permittees will adopt to ensure adequate funding for the HCP. enXco will be responsible for funding all aspects of HCP implementation, as shown below.

- enXco will acquire credits from a USFWS and DFG-approved conservation bank as described in Section 5.2.2. enXco will post a bond or letter of credit with the County prior to construction that will ensure acquisition of credits. Credits will be acquired prior to construction.
- Construction-related surveys and biological monitoring will be included in the project construction budget.
- All restoration costs will be included in the project budget. Ensuring restoration occurs, final building permits from Solano County will not be issued until restoration is complete.

7.2 Assurances

7.2.1 "No Surprises" Assurances, Definitions and Background

Section 10 regulations [50 CFR 17.22 (b)(1)(iii)] require that an HCP specify the procedures to be used for dealing with unforeseen circumstances that may arise during the implementation of the HCP. In addition, the Habitat Conservation Plan Assurances ("No Surprises") Rule [50 CFR 17.21(b)(5)-(6) and 17.22(b)(5)-(6); 63 FR 8859] defines *unforeseen circumstances* and *changed circumstances* and describes the obligations of the permittees and USFWS.

The purpose of the No Surprises Rule is to provide assurances to nonfederal landowners participating in habitat conservation planning under ESA that no additional land restrictions or financial compensation will be required for species adequately covered by a properly implemented HCP, in light of changed or unforeseen circumstances, without the consent of the permittees. *Changed circumstances* means changes in circumstances affecting a species or geographic area covered by the HCP that can reasonably be anticipated by plan developers and USFWS and that can be planned for (e.g., the listing of a new species, fire or other natural catastrophic events in areas prone to such events). The rule defines *unforeseen circumstances* as changes in circumstances that affect a species or geographic area covered by the HCP that could not reasonably be anticipated by plan developers and USFWS at the time of the plan's negotiation and development and that result in a substantial and adverse change in status of the covered species.

7.2.2 Summary of Circumstances

No *changed circumstances* or *unforeseen circumstances* are anticipated in this HCP. enXco considered the potential for newly listed species and the designation of critical habitat; however, given the

narrow and specific focus of this HCP on CTS, additional newly listed species would likely require additional analysis beyond that considered a changed or unforeseen circumstance. The designation of additional critical habitat for CTS, were it to include the Plan Area, would occur after enXco's facilities are in place. This designation would not likely affect enXco because the HCP and its no surprises assurances would be in effect. If critical habitat was designated for another species, the permittees would only need to address that if they had a future Section 7 nexus.

Chapter 8
Alternatives to Take

8.1 ESA Requirement

Section 10(a)(2)(A)(iii) of the ESA requires that an HCP describe what "alternatives to such taking" were considered, and the reasons why such alternatives are not being utilized. Two alternatives commonly included in an HCP alternatives analysis are (1) any specific alternative that would reduce take levels below those anticipated for the project; and (2) a no-action alternative, under which either no permit would be issued and take would be avoided, or the project would not be constructed or implemented (U.S. Fish and Wildlife Service 1996). The reduced take and no-action alternatives to the proposed project are described below.

8.2 Reduced Take Alternative

The Reduced Take Alternative would involve construction of 17 fewer wind turbines and approximately 5.4 miles less of access road, resulting in reductions of approximately 11.1 acres of permanent impacts and 30.5 acres of temporary impacts. Aquatic habitat would remain unaffected. While dispersal habitat could be degraded, temporary effect areas are expected to fully recover their dispersal value within 1 year of disturbance, and permanent effect areas (i.e., roads) would not cause migration barriers, would still be suitable for dispersal, and would be mitigated. Overall, the magnitude of the degradation to dispersal habitat is very small compared to total suitable dispersal habitat; these effects are justified by the clear benefit of providing 320–400 million kilowatt hours (kWh) of renewable energy per year. This alternative was rejected because project effects are already expected to be minimal in CTS dispersal habitat. Fewer turbines and roads would result in a nominal reduction in take, but would result in a substantial reduction in generation capacity (approximately 29% of capacity of the project). This alternative would not achieve the project purpose of constructing 130–160 MW of power; moreover, a reduction of this size would mean 92–115 million kWh per year less power, diminishing the project's contribution to California's Renewable Portfolio Standard goal of 30% reduction of greenhouse gases by 2030 pursuant to AB32.

Alternative siting of facilities and routing of collection lines are still preliminary; the estimates enumerated in the HCP represent a maximum disturbance footprint. enXco will seek to minimize its project footprint and further reduce its habitat effects without reducing the number of turbines. For example, the collection line near Bird's Landing Road may be rerouted to connect and parallel the collection line for turbine B14 (Figure 2-3). Such project modifications are expected to result in a nominal reduction in take because of the proposed avoidance and minimization measures and the project's limited effects on dispersal habitat.

8.3 No-Action Alternative

Under the No-Action Alternative, an ITP would not be issued and take would be prohibited under Section 9 of the ESA. Under this alternative, there would be no impacts on the species. This alternative was rejected because it would not meet the objective of developing a commercially viable wind energy facility that would deliver renewable energy to the PG&E/CAISO power grid to meet California's Renewable Portfolio Standard goals and help reduce greenhouse gas emissions pursuant to AB32 and the County's General Plan.

Chapter 9
Revisions and Amendments

Two types of changes may be made to the HCP and/or the HCP Permits and/or its associated documents.

- Minor amendments.
- Standard amendments.

Revisions and amendments will be processed in accordance with all applicable legal requirements, including but not limited to ESA, NEPA, and other applicable regulations.

9.1 Minor Amendments

Minor amendments to the HCP are changes to the HCP that do not require an amendment to the ITP. Such changes are provided for under the conservation strategy (e.g., adaptive management changes and responses to changed circumstances). Revisions may not modify the scope or nature of activities or actions covered by the Section 10(a)(1)(B) permit; result in operations under the HCP that are significantly different from those contemplated or analyzed in connection with the HCP as approved; result in adverse impacts on the environment that are new or significantly different from those analyzed in connection with the HCP as approved; or result in additional take not analyzed in connection with the HCP as approved.

Minor amendments to the HCP may include but are not limited to those listed below.

1. Correction of any maps or exhibits to correct errors in mapping or to reflect previously approved changes in the Section 10(a)(1)(B) permit or HCP.
2. Modifying existing or establishing new incidental take avoidance measures.
3. Modifying reporting protocols for monitoring reports.
4. Minor changes to monitoring or reporting protocols.
5. Revising restoration techniques.
6. Any other modifications to the HCP that meet the criteria listed below.
    a. Will not result in operations under the HCP that are significantly different from those analyzed in connection with the HCP as approved.
    b. Will not result in impacts on the environment or take effects that are new or significantly different from those analyzed in connection with the HCP as approved.
    c. Will allow for the approval or execution of agreements to facilitate execution and implementation of the HCP.
    d. Will allow the permittee to delegate any of its duties specified by the HCP to a third party under its direct control.

Minor revisions may be proposed by USFWS or the HCP permittees. The party proposing a revision to the HCP will circulate the proposed revision along with an explanation of why the revision is necessary or desirable, and a description of why the party believes the effects of the proposed revision are more beneficial than adverse and are not significantly different from those described or anticipated under the HCP as originally adopted. If enXco and USFWS agree to the proposed revision, enXco will process the revision to the HCP. USFWS will respond in writing to a proposed revision within 60 calendar days of receipt of the request. The responses will (1) concur with the proposed revision; (2) identify additional information necessary to enable USFWS to approve or disapprove the revision; or (3) disapprove the revision. If USFWS disapproves the revision, it must be processed as an amendment to the Plan and Section 10(a)(1)(B) Permit. If USFWS disapproves the revision, it will include in its written response an explanation of its determination.

9.2 Standard Amendment

A standard amendment involves amendment(s) to the HCP, the ITP, and/or NEPA document(s). The following summarizes the types of changes that may require a plan amendment and the procedures for approval.

Standard amendments may include any of the following types of changes to the HCP.

1. Significant changes to the HCP that were not addressed in the HCP, including but not limited to the following.
    a. Changes to the method for calculating compensation for incidental take, which would increase the levels of incidental take permitted for the HCP.
    b. Changes to funding except as otherwise provided for in the HCP to account for all adjustments for inflation, adaptive management, and changed circumstances.
2. Changes to the covered activities that were not addressed in the HCP as originally adopted, and that do not otherwise meet the revision provisions above.
3. Extending the term of the HCP permits past the 36-year term.

Specific procedures for requesting Amendments to Section 10(a)(1)(B) Permits are described below.

9.2.1 Amendments to the Section 10(a)(1)(B) Permits

Standard amendments to the HCP will require amendment of the Section 10(a)(1)(B) permit. Following receipt of a complete application package for a proposed amendment to a Section 10(a)(1)(B) permit, USFWS will publish a notice of the proposed amendment in the Federal Register as required by ESA. USFWS will use its reasonable efforts to process the proposed amendment within 180 calendar days of publication, except where longer periods are required by law. The amendment of a Section 10(a) permit will be treated as an original permit application. Such applications typically will require submittal of a revised HCP, a completed permit application form with appropriate fees, and preparation of an environmental review document prepared in accordance with NEPA. However, specific document requirements may vary based on the nature of the amendment.

9.2.2 Suspension/Revocation

USFWS may suspend or revoke the ITP if enXco fails to implement the HCP in accordance with the terms and conditions of the permits or if suspension or revocation is otherwise required by law. Suspension or revocation of the Section 10(a)(1)(B) permit, in whole or in part, by USFWS will be in accordance with 50 CFR 13.27-29, 17.32 (b)(8).

9.2.3 Permit Renewal

Although the Project could be completed within the 36-year permit term, if the wind lease is renewed, permit renewal may also be necessary. Upon expiration, the Section 10(a)(l)(B) permit may be renewed without the issuance of a new permit, provided that the permit is renewable, and that biological circumstances and other pertinent factors affecting covered species are not significantly different than those described in the original HCP. To renew the permit, enXco will submit to USFWS the written items listed below.

1. A request to renew the permit, referencing the original permit number.
2. Certification that all statements and information provided in the original HCP and permit application, together with any approved HCP amendments, are still true and correct; a list of changes must be included.
3. A description of any take that has occurred under the existing permit.
4. A description of any portions of the project still to be completed, if applicable, or what activities covered under the original permit the renewal is intended to cover.

If USFWS concurs with the information provided in the request, it will renew the permit consistent with permit renewal procedures required by federal regulation (50 CFR 13.22). If enXco files a renewal request, and the request is on file with the issuing USFWS office at least 30 days prior to the permit's expiration date, the permit will remain valid while the renewal is being processed, provided the existing permit is renewable. However, enXco may not take listed species habitat beyond the quantity authorized by the original permit. If enXco fails to file a renewal request within 30 days prior to permit expiration, the permit will become invalid upon expiration. enXco must have complied with all reporting requirements to qualify for a permit renewal.

9.2.4 Permit Transfer

In the event of sale or transfer of the project during the life of the permit, a new permit application, permit fee, and an Assumption Agreement will be submitted to USFWS by the new permittee(s). The permittee(s) will commit to all requirements regarding the take authorization and conservation strategy obligations of this HCP unless otherwise specified in the Assumption Agreement and agreed to in advance with USFWS.

Chapter 10
References Cited

10.1 Printed References

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10.2 Personal Communications

Tovar, Michelle. Senior Fish and Wildlife Biologist, Endangered Species Program, U.S. Fish and Wildlife Service. March 11, 2009—email to Brad Schafer of ICF International.

Appendix A

Covered Species Assessment

Table A-1. Special-Status Plants Potentially Occurring in the Montezuma Hills Region, Solano County

Common Name *Scientific Name*	Legal Status[a] Fed/State/CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Covered/Not Covered, and Rationale[b]
Suisun thistle *Cirsium hydrophilum* var. *hydrophilum*	E/–/1B	Known only from Suisun Marsh in Solano County	Salt marshes and swamps; below 3 ft	Jul–Sep	Not covered; no habitat present in project area
Soft bird's-beak *Cordylanthus mollis* ssp. *mollis*	E/R/1B	San Francisco Bay region; Suisun Marsh; Contra Costa, Marin*, Napa, Solano, Sacramento*, and Sonoma* Counties	Tidal salt marsh	Jul–Sep	Not covered; no habitat present in project area
Contra Costa wallflower *Erysimum capitatum* ssp. *angustatum*	E/E/1B	Contra Costa County	Inland dunes	Mar–Jul	Not covered; no habitat present in project area
Contra Costa goldfields *Lasthenia conjugens*	E/–/1B	Scattered occurrences in Coast Range valleys and southwest edge of Sacramento Valley; Alameda, Contra Costa, Mendocino, Napa, Santa Barbara*, Santa Clara*, and Solano Counties; historically distributed through the north coast, southern Sacramento Valley, San Francisco Bay region, and south coast	Alkaline or saline vernal pools and swales; below 700 ft	Mar–Jun	Not covered; no habitat present in project area
Mason's lilaeopsis *Lilaeopsis masonii*	–/R/1B	Southern Sacramento Valley; Sacramento–San Joaquin Delta; northeast San Francisco Bay area; Alameda, Contra Costa, Marin*, Napa, Sacramento, San Joaquin, and Solano Counties	Freshwater and intertidal marshes, streambanks in riparian scrub; generally at sea level	Apr–Nov	Not covered; no habitat present in project area
Colusa grass *Neostapfia colusana*	T/–/1B	Central Valley: Colusa, Glenn, Merced, Solano, Stanislaus, and Yolo Counties	Adobe soils of vernal pools, generally below 650 ft	May-Sep	Not covered; no habitat present in project area
Antioch Dunes evening-primrose *Oenothera deltoides* ssp. *howellii*	E/E/1B	Northeast San Francisco Bay region, known from three native occurrences; Contra Costa and Sacramento Counties	Inland dunes; generally below 330 ft	Mar–Sep	Not covered; no habitat present in project area
Solano grass *Tuctoria mucronata*	E/–/1B	Southwestern Sacramento Valley: Solano and Yolo Counties	Vernal pools, mesic grassland, below 500 ft	Apr-Jul	Not covered; no habitat present in project area

Common Name *Scientific Name*	Legal Status[a] Fed/State/CNPS	Geographic Distribution	Habitat Requirements	Blooming Period	Covered/Not Covered, and Rationale[b]

[a] Status explanations:

Federal

E = listed as endangered under the federal Endangered Species Act.

T = listed as threatened under the federal Endangered Species Act.

– = no listing.

State

R = Listed as Rare under the Native Plant Protection Act.

E = listed as endangered under the California Endangered Species Act.

– = no listing.

California Native Plant Society

1B = List 1B species: rare, threatened, or endangered in California and elsewhere.

– = no listing.

* = extirpated from county

Table A-2. Special-Status Wildlife Species Potentially Occurring in the Montezuma Hills Region, Solano County

Common Name *Scientific Name*	Status Federal/State	Geographic Distribution	Habitat Requirements	Covered/Not Covered, and Rationale.
Insects				
Delta green ground beetle *Elaphrus viridus*	T/—	Restricted to Olcott Lake and other vernal pools at Jepson Prairie Preserve, Solano County	Sparsely vegetated edges of vernal lakes and pools; occurs up to 250 ft from pools	Not covered; not likely to occur in Plan Area; no suitable habitat present; species occurs only at Jepson Prairie
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	T/—	Streamside habitats below 3,000 ft throughout the Central Valley	Riparian and oak savanna habitats with elderberry shrubs; elderberry is the host plant	Not covered; potential habitat is present (single elderberry shrub) but there are no nearby records, shrub is likely at edge of species' range, and shrub would not be affected by covered activities
Callippe silverspot butterfly *Speyeria callippe callippe*	E/—	Occurs at only several locations: near Oakland, San Bruno Mountain, and west of I-680 in Solano County	Annual grassland habitats around northern San Francisco Bay; larvae feed on host plant (*Viola pedunculata*); adults feed on floral nectar	Not covered; not likely to occur in Plan Area; no suitable habitat present
Crustaceans				
Conservancy fairy shrimp *Branchinecta conservatio*	E/—	Disjunct occurrences in Solano, Merced, Tehama, Ventura, Butte, and Glenn Counties	Large, deep vernal pools in annual grasslands	Not covered; not likely to occur in Plan Area; no suitable habitat present
Vernal pool fairy shrimp *Branchinecta lynchi*	T/—	Central Valley, central and south Coast Ranges from Tehama to Santa Barbara Counties; isolated populations in Riverside County	Common in vernal pools; also found in sandstone rock outcrop pools	Not covered; species has low likelihood of occurrence in Plan Area; potential habitat present adjacent to Plan Area, but impacts will be avoided within 250 feet of aquatic habitat
Vernal pool tadpole shrimp *Lepidurus packardi*	E/—	Shasta to Merced Counties	Vernal pools and ephemeral stock ponds	Not covered; species has low likelihood of occurrence in Plan Area; potential habitat present adjacent to Plan Area, but impacts will be avoided within 250 feet of aquatic habitat
Reptiles and Amphibians				
California tiger salamander *Ambystoma californiense*	T/C	Central Valley, including Sierra Nevada foothills to approximately 1,000 ft, and coastal region from Butte to northeastern San Luis Obispo Counties	Small ponds, lakes, or vernal pools in grasslands and oak woodlands for larvae; rodent burrows, rock crevices, or fallen logs for cover for adults and for summer dormancy	Covered; species potentially occurs in Plan Area; potential habitat present

Common Name *Scientific Name*	Status Federal/State	Geographic Distribution	Habitat Requirements	Covered/Not Covered, and Rationale.
California red-legged frog *Rana draytonii*	T/SSC	Along coast and coastal mountain ranges from Marin to San Diego Counties and in the Sierra Nevada from Tehama to Fresno Counties	Permanent and semipermanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent vegetation; may aestivate in rodent burrows or cracks during dry periods	Not covered; Plan Area is outside species' range
Giant garter snake *Thamnophis gigas*	T/T	Central Valley from the vicinity of Burrel in Fresno County north to near Chico in Butte County; has been extirpated from areas south of Fresno	Sloughs, canals, low-gradient streams and freshwater marsh habitats with prey base of small fish and amphibians; irrigation ditches and rice fields; requires grassy banks and emergent vegetation for basking and areas of high ground protected from flooding during winter	Not covered; Plan Area is outside species' range
Birds				
Bank swallow *Riparia riparia*	—/T	Much of the state, less common in mountainous areas of the north coast and in coniferous or chaparral habitats	Nests in bluffs or banks, usually adjacent to water, where soil consists of sand or sandy loam	Not covered; no suitable habitat present; species not observed during last 3 years of monitoring in Montezuma Hills
California clapper rail *Rallus longirostris obsoletus*	E/E,FP	Marshes around San Francisco Bay and east through Sacramento–San Joaquin River Delta to Suisun Marsh	Restricted to salt marshes and tidal sloughs; usually associated with heavy growth of pickleweed; feeds on mollusks in sloughs	Not covered; no suitable habitat present; species not observed during last 3 years of monitoring in Montezuma Hills
California black rail *Laterallus jamaicensis coturniculus*	—/T,FP	Permanent resident in San Francisco Bay and east through Delta into Sacramento and San Joaquin Counties; small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial Counties	Tidal salt marshes associated with heavy growth of pickleweed; also brackish marshes or freshwater marshes at low elevations	Not covered; no suitable habitat present; species not observed during last 3 years of monitoring in Montezuma Hills

Common Name *Scientific Name*	Status Federal/State	Geographic Distribution	Habitat Requirements	Covered/Not Covered, and Rationale.
Mountain plover *Charadrius montanus*	PT/SSC	Does not breed in California; in winter, found in Central Valley south of Yuba County; along coast in parts of San Luis Obispo, Santa Barbara, Ventura, and San Diego Counties; parts of Imperial, Riverside, Kern, and Los Angeles Counties	Open plains or rolling hills with short grasses or very sparse vegetation; nearby bodies of water not needed; may use newly plowed or sprouting grain fields	Not covered; no suitable habitat present; species not observed during at least 3 years of monitoring in Montezuma Hills
Swainson's hawk *Buteo swainsoni*	—/T	Lower Sacramento and San Joaquin Valleys, Klamath Basin, and Butte Valley; highest nesting densities near Davis and Woodland, Yolo County	Nests in oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grainfields	Not covered: foraging habitat is present in action area, and species has been observed onsite, but nesting habitat will not be affected and no take of this species has been documented during several years of monitoring in WRA
Mammals				
Salt marsh harvest mouse *Reithrodontomys raviventris*	E/E, FP	San Francisco, San Pablo, and Suisun Bays; Sacramento–San Joaquin River Delta	Salt marsh with dense plant cover of pickleweed and fat hen; adjacent to an upland site	Not covered; not likely to occur in Plan Area; no suitable habitat present or nearby

Status explanations:

Federal

E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
PT = proposed for federal listing as threatened under the federal Endangered Species Act.
— = no listing.

State

E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
C = candidate for listing under the California Endangered Species Act.
FP = fully protected under the California Fish and Game Code.
SSC = species of special concern in California.
— = no listing.

Appendix B

Agency Correspondence

ICF Jones & Stokes
an ICF International Company

Memorandum

Date: March 17, 2009

To: Michelle Tovar, U.S. Fish and Wildlife Service, Endangered Species Division

cc:
Dick Timmons, enXco
Mark Tholke, enXco
Annie Mudge, Cox Castle & Nicholson
Liam Davis, California Department of Fish and Game

From: Stephanie Myers

Subject: **Authorization Request to Conduct California Tiger Salamander Surveys for the Shiloh 3 Project in Solano county**

As per your March 11, 2009 email recommendation we are requesting authorization to conduct aquatic and upland surveys for California tiger salamanders for the Shiloh 3 project. We are providing information regarding our proposed aquatic surveys for California tiger salamanders (CTSs) on the Shiloh 3 Project site. The surveys will be conducted by me and Jennifer Alvarez working under Federal Permit TE-148552-9.2 (attached).

Potential Aquatic Habitat

The following is a summary of the proposed survey sites located in the project area and within 1.24 miles of the project area (Figure 3). Because of limited property access we used aerial photographs in conjunction with field surveys to identify 34 potential breeding sites (defined as sites that pond water or appear to pond water for more than 3 months of the year). Seven of the potential breeding sites are within the project area; the remaining 27 are within a 1.24-mile radius.

Within the Project Area

As indicated in your recent email we will focus our survey effort on the east side of the project area and propose to conduct 2 years of aquatic surveys and 1 upland survey at three sites (Sites 7, 8, and 9 on Figure 3). We may need to use minnow traps depending on what we find during our initial survey and will contact you with an official request and details on our methods prior to setting out traps. We will provide a map of our proposed upland survey locations in late summer 2009.

Within 1.24 Miles of the Project Area

We identified 9 potential breeding sites within a 1.24-mile radius of the eastern portion of the project area (Sites 22 – 30 on Figure 3). If we can obtain property access we will add these locations to our survey effort.

Will you please notify us as soon as possible if it looks like USFWS is not going to accept aquatic survey results this year. Please contact me or Brad Schafer at 916-737-3000 if you have any questions. Or you can email us at smyers@jsanet.com and at bschafer@jsanet.com.

Attachments

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

LIST OF AUTHORIZED INDIVIDUALS
TE-795934-9.2

1. Individuals authorized to independently conduct survey activities for the vernal pool branchiopods pursuant to this permit:

   Jennifer Haire, Patrick Stone, Erin Hitchcock, and Julia Camp.

2. Individuals authorized to independently conduct survey activities for the flycatcher pursuant to this permit:

   William Widdowson, Margaret Widdowson, Douglas Leslie, and Julia Camp.

3. Individuals authorized to independently conduct capture, banding, and color-banding flycatcher pursuant to this permit:

   William Widdowson.

4. Individuals authorized to independently conduct activities for the gnatcatcher pursuant to this permit:

   Steven Avery and William Widdowson.

5. Individuals authorized to independently conduct activities for the Mexican spotted owl pursuant to this permit:

   Steven Avery, William Widdowson, and Douglas Leslie.

LIST OF AUTHORIZED INDIVIDUALS
TE-795934-9.2

6. Individuals authorized to independently conduct activities for the cactus ferruginous pygmy owl pursuant to this permit:

   William Widdowson.

   Doug Leslie must obtain at least 8 hours of field experience surveying for cactus ferruginous pygmy-owls with Mr. Widdowson before conducting surveys independently. Hours spent attending a Service-approved pygmy-owl survey training session may be counted toward the experience requirement.

7. Individuals authorized to independently conduct activities for the smelt pursuant to this permit:

   Donna Maniscalco and Jeff Kozlowski.

8. Individuals authorized to independently conduct activities for the tiger salamander pursuant to this permit:

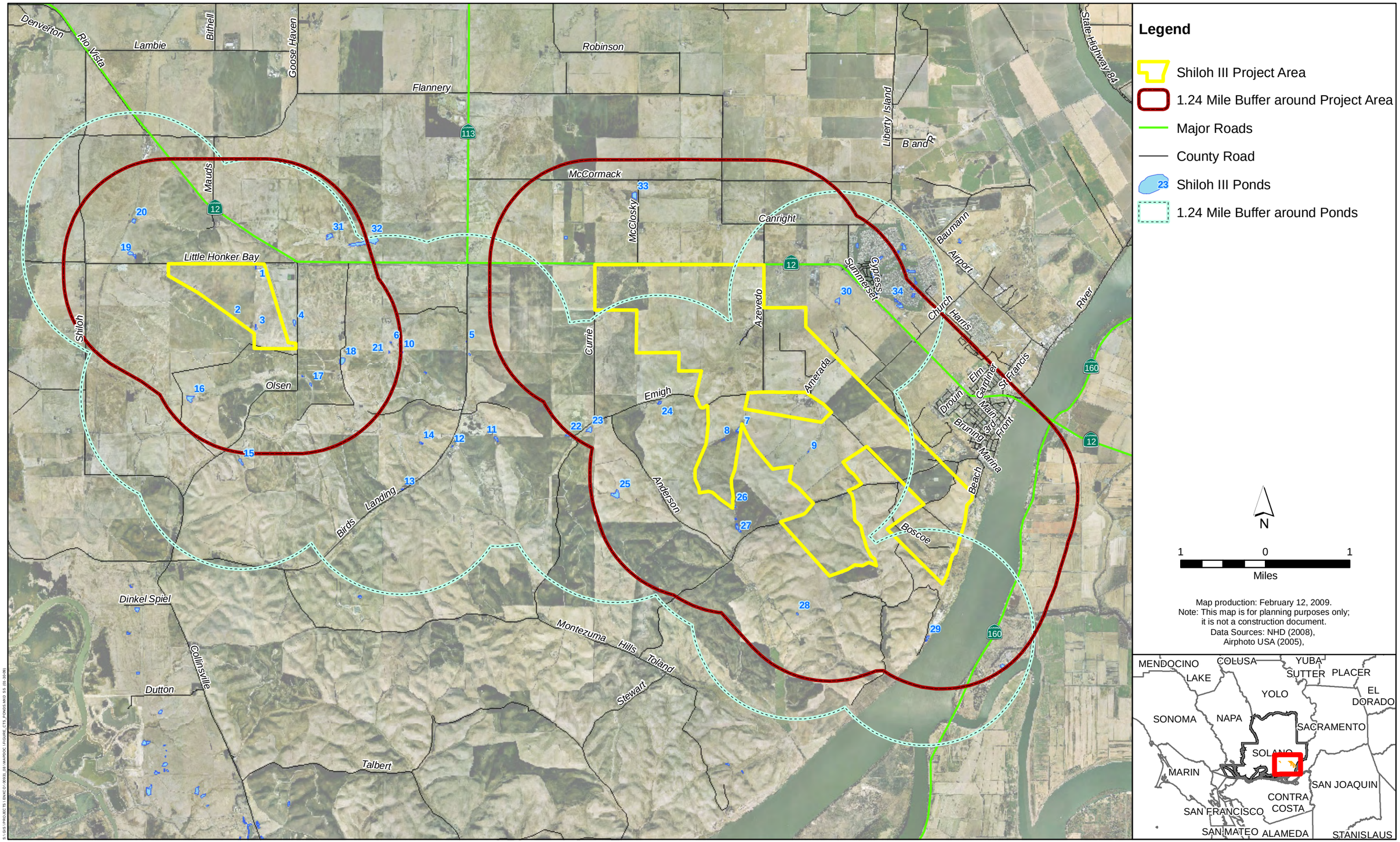
   Stephanie Myers and Jennifer Haire.

Supervised individuals may conduct activities pursuant to this permit only under the direct on-site supervision of the appropriate independently authorized individual listed above.

20 oct 2008
Date

E. Tatterall
Division Chief

This List is only valid if it is dated on or after the permit issuance date.



ICF Jones & Stokes
an ICF International Company

Figure 3
Potential Breeding and Upland Habitat for California Tiger Salamanders Within the Shiloh III Project Area

From:	Michelle_Tovar@fws.gov
To:	Brad Schafer;
cc:	Mudge, Annie; Dick Timmons; ldavis@dfg.ca.gov; Mark Tholke (E-mail); Stephanie Myers;
Subject:	Re: Shiloh 3 wind project CTS site assessment
Date:	Wednesday, March 11, 2009 11:36:16 AM

Hi Brad,

This is just to re-cap our phone discussion yesterday afternoon.

1.) Please make sure as the project moves forward that any other potentially listed species are addressed such as listed plants, fairy shrimp.

2.) The Service agrees that California tiger salamander (CTS) surveys in the eastern section of the property are justified. There are no immediate occurrences of CTS near this portion of the project and protocol surveys will help further our knowledge of the species in that area.

3.) The Service requested that a formal request be sent to our office for CTS protocol level surveys in the eastern area. Protocol level surveys consists of two larval years and one dry drift fence. If the survey is not completed exactly to protocol the Service will not accept negative results.

4.) The Service will not accept surveys in the western portion of the project due to close proximity to know occurrences.

5.) Please keep in mind the low wet year this breeding season. CTS breeding has drastically reduced this year and the Service is still trying to determine if negative wet surveys this year will be valid.

also, i would contact CDFG on what their thoughts are on CTS.

Please let me know if you have any more questions and thank you for approaching the Service early in the process.
~Michelle

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
Michelle Tovar
Senior Fish and Wildlife Biologist
Endangered Species Program
U.S. Fish and Wildlife Service
2800 Cottage Way, Suite W-2605
Sacramento California, 95825

Ph: (916) 414-6646
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

"Brad Schafer" <BSchafer@jsanet.com>

02/20/2009 05:50 PM

To <Michelle_Tovar@fws.gov>

cc "Mudge, Annie" <AMudge@coxcastle.com>, "Dick Timmons" <DickT@enxco.com>, "Mark Tholke \(E-mail\)" <MarkT@enxco.com>, "Stephanie Myers" <SMyers@jsanet.com>, <ldavis@dfg.ca.gov>

Subject Shiloh 3 wind project CTS site assessment

Hello Michelle,

EnXco is proposing to construct a new wind project in Solano County to be called the Shiloh 3 Project. We are assisting enXco with baseline environmental studies that will ultimately be used to support Solano County's issuance of a Conditional Use Permit for the project. The project will be subject to CEQA, however enXco is also moving forward with studies to ensure compliance with the Endangered Species Act and other regulations. To that end, I am attaching a site assessment for California Tiger Salamander. Given the timing of the project and the survey timing requirements for CTS, we request a meeting as soon as possible to review the project and the need for CTS surveys.

Please contact me if you have any questions on this material. I look forward to hearing from you soon.

Thanks,
Brad

Brad Schafer
Project Manager/ Biologist
ICF Jones & Stokes
630 K Street, Suite 400 | Sacramento | CA 95814
t 916.737.3000 | f 916.737.3030 | e bschafer@jsanet.com

[attachment "Shiloh 3 Wind Project_CTS site assessment.pdf" deleted by Michelle

Tovar/SAC/R1/FWS/DOI]

August 13, 2009

Michelle Tovar
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service, Endangered Species Division
2800 Cottage Way, Suite W2605
Sacramento, CA 95825

Subject: Results of the First Year Aquatic Surveys for California Tiger Salamander for the Shiloh III Wind Project and Drift Fence Study Proposal

Dear Ms. Tovar:

This letter presents the methods and results of aquatic surveys for California tiger salamander (*Ambystoma californiense*) at the proposed Shiloh III project site in Solano County (Figure 1). As you are aware, a site assessment for California tiger salamander was submitted to your office on February 20, 2009, and a subsequent request to conduct protocol-level aquatic larval surveys was submitted to you on March 17, 2009. Authorization to conduct larval aquatic surveys was received on March 18, 2009. An additional request to use minnow traps during the larval surveys was submitted to your office on April 9, 2009 and authorization to proceed was received on April 9, 2009. Aquatic surveys were conducted by Jennifer Haire, Stephanie Myers, and Will Kohn under federal permit TE-795934-9.3.

Since we received authorization to proceed with the aquatic surveys earlier this year, enXco, the project proponent, has revised the project area and has submitted revised project maps to Solano County. As depicted in Figure 1, the project area now includes a different project boundary on the eastern side, several parcels in the approximate center of the project area, and an electrical collection line route connecting the various pieces of the project. Overall, the total acreage of the proposed project is slightly smaller than what was originally proposed.

Background

As you requested, we focused our survey effort on the east side of the project area at three sites within the project area (Sites 7, 8, and 9 on Figure 1). In the site assessment report we mistakenly identified Site 9 as aquatic habitat on the aerial photograph. Site 9 is actually a natural gas well site; therefore, it was excluded from our survey effort. Following our initial site survey we determined that Sites 7 and 8 were both too deep and surrounded with dense cattail (*Typha latifolia*) and tule (*Scirpus acutus)* to allow adequate surveying with a seine or dipnets, which necessitated the use of minnow traps.

During the site assessment we identified nine potential breeding sites outside of the project area but within a 1.24-mile radius of the eastern portion of the project area (Sites 22 – 30 on Figure 1). We obtained property access in early May 2009 to one location, Site 24, and added this site to our survey effort.

Since the site assessment was submitted to your office in February, a new location of California tiger salamander in the region was submitted to the California Natural Diversity Database and to your office on July 1, 2009 by Stephanie Myers. The record documents that a 3-inch long California tiger salamander larva was found on May 8, 2009 in a seasonal pond near the corner of Olsen Road and Highway 12 (the pond location corresponds to Site 4 depicted on the attached Figure 1. To our knowledge, no other California tiger salamanders have been observed in the region surrounding the project area in 2009.

Methods

Breeding habitat for California tiger salamander does not need to provide appropriate ponding every year; some years, insufficient rainfall amounts may preclude successful use of potential breeding sites or successful recruitment, but on average these locations may be used. To address this issue the USFWS and California Department of Fish and Game (DFG) October 2003 *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (Guidelines) recommend at least 70% average rainfall between September 1 and April 1 for surveys to be considered reliable. We contacted George Cline with the National Oceanographic and Atmospheric Association (NOAA) for information on rainfall amounts to determine if there was adequate rainfall for California tiger salamander breeding during our surveys.

ICF Jones & Stokes biologists conducted aquatic larval sampling surveys at three sites (Sites 7, 8, and 24) in accordance with the Guidelines (Figure 1). The date, time, surface area, depth of pool, water temperature, turbidity, presence of aquatic vegetation (submergent and emergent), dominant invertebrates, and all vertebrates observed were recorded at each site. Photographs of the survey sites are presented in Figures 2a-2c.

The biologists used minnow traps to conduct aquatic larval sampling at Sites 7 and 8 and a seine to conduct surveys at Site 24 (Figure 1). Minnow traps were set for three 3-day intervals with a minimum of 10 days in between survey intervals. Trapping was conducted April 7-10, April 21-24, and May 5-8, 2009. Minnow traps were attached to a rope and anchored to the shore using rebar. Flagging and tags with the surveyors names, phone number, and permit numbers were attached to each rebar associated with each trap. Minnow traps 1 and 2 were placed in open water in the seasonal drainage of Site 8. Traps 3-8 were placed approximately 75 feet apart around the shoreline of the pond at Site 7. The distance between traps 6, 7, and 8 was somewhat greater because of dense tule and cattail patches. Traps were not set in the drainage between

Traps 2 and 3 because there was a large nesting colony of red-winged blackbirds (*Agelaius phoeniceus*).

Traps were placed in the ponds in the late morning or early afternoon and checked the following morning or early afternoon. For each 3-day interval, the date, time, air and water temperatures, presence of aquatic vegetation (submergent and emergent), and dominant invertebrates were recorded. Each day that minnow traps were checked, the number and type of amphibian caught in each trap were recorded. If invertebrates were caught, this was recorded as well. All animals caught in the minnow traps were identified and immediately released back into the pond.

Results

No eggs or adult or larval California tiger salamanders were observed during our aquatic surveys. Survey results for each site are summarized below and in Table 1.

Minnow Trap Surveys – Sites 7 and 8

Site 7 is a seasonal pond that is approximately 1.93 acres of open water surrounded on three sides by cattails and tules (Figure 2a). According to the property owner, Paul Dietrich, the pond and associated drainage (Site 8) dry up in years with little rainfall. Site 8 consists of a seasonal drainage with a spring at its westernmost end that flows into Site 7. The drainage contains dense tules and cattails with only limited open water areas. Traps 1 and 2 were placed in two small open water areas (Figure 2b). Trap 1 was placed in an area of approximately 10 by 10 feet of open water and Trap 2 was placed in an area of approximately 30 by 20 feet of open water.

First Survey Interval. Traps were opened on April 7 and were checked at approximately 24 hour intervals on April 8, 9, and 10. It rained on April 7 and 9. Nothing was caught in traps during this survey interval. Water was flowing from Site 8 into Site 7 which was full. There was approximately 90% emergent cover near Trap 1, 80% emergent cover near Trap 2, and 50% emergent cover around Pond 7's perimeter. There was approximately 10% submergent cover in Pond 7. We did not take a water temperature. The dominant invertebrate species were cladocerans (water fleas), corixids (water boatman), conchostracans (clam shrimp), and hydrophilids (water scavenger beetles).

Second Survey Interval. Traps were opened on April 21 and were checked at approximately 24 hour intervals on April 22, 23, and 24. It rained on April 24. Four Pacific treefrog (*Hyla regilla*) larvae were captured at Traps 2 and 8 while Pacific treefrog eggs were observed in Pond 7. Two garter snakes (*Thamnophis* sp.) were observed near Trap 3. Both live and dead water scavenger beetles and an aquatic snail were also captured in traps. Emergent and submergent vegetation cover was similar to the first survey. Water temperature was 70 degrees Fahrenheit. The

dominant invertebrate species were cladocerans (water fleas), corixids (water boatman), conchostracans (clam shrimp), and hydrophilids (water scavenger beetles).

Third Survey Interval. Traps were opened on May 5 and were checked at approximately 24 hour intervals on May 6, 7, and 8. One Pacific treefrog larva and a dead garter snake were found in Trap 2. Thirteen Pacific treefrog larvae and 3 dead water scavenger beetles were captured in Traps 3-8. The emergent and submergent vegetation cover did not differ substantially from that observed during the first survey. Water temperature was 72 degrees Fahrenheit. The dominant invertebrate species were cladocerans (water fleas), corixids (water boatman), conchostracans (clam shrimp), and hydrophilids (water scavenger beetles).

Seine Survey- Site 24

Site 24 was only surveyed once because we did not obtain property access until early May 2009. The pond is approximately 0.62 acre and 5 feet deep. The water temperature was 77 degrees Fahrenheit with 10% emergent and 20% submergent cover. Because the pond was fairly shallow we were able to seine at least 90% of the pond. We captured several hundred Pacific treefrog larvae. The dominant invertebrates were notonectids (backswimmers), cladocerans (water fleas), corixids (water boatman), conchostracans (clam shrimp), and hydrophilids (water scavenger beetles).

This site is surrounded by undisturbed grassland habitat that does not appear to be farmed or disked and therefore provides higher quality upland habitat for California tiger salamander than much of the project site (Figure 2c).

Drift Fence Study Proposal

Based on the location of suitable California tiger salamander aquatic habitat in the current project area, we are proposing to construct drift fences and pitfall traps around the pond at Site 7 and on both sides of the drainage near Traps 1 and 2 at Site 8 (Figure 3). Approximately 1,160 feet of drift fence and 45 pitfall traps would be installed around Pond 7. Approximately 365 feet 13 pitfall traps to the north and 340 feet and 12 pitfall traps to the south would be installed in the vicinity of Traps 1 and 2 (Figure 3). Drift fences and pitfall traps would be installed according to the Guidelines.

Please provide comments, if appropriate, on our proposed drift fence/pitfall trap study design **no later than September 15, 2009** so that we have sufficient time to purchase and install the trapping array prior to the October 15th installation deadline required by the Guidelines. If you have any questions about the survey methodology or results, please contact Stephanie Myers at (916) 737-3000.

Sincerely,

Brad Schafer
Project Manager/Biologist

Attachments

cc: Janice Gan, California Department of Fish and Game
Dick Timmons, enXco
Annie Mudge, Cox Castle & Nicholson
Stephanie Myers, ICF Jones & Stokes

Appendix C
Grassland Restoration Plan

This plan describes how grasslands will be restored on the Shiloh III project site following enXco's construction of a wind farm, and following any grassland-disturbing maintenance activities that take place during the 36-year permit term of the Shiloh III Habitat Conservation Plan prepared in compliance with Section 10 of the federal Endangered Species Act.

Annual grasslands will be restored in locations that are cleared for the project. The existing topsoil will be stripped and stockpiled for later reapplication to disturbed surfaces. The stockpiled topsoil will contain seeds and root stock from existing annual grasslands and will provide propagation material for revegetation efforts. The annual grasslands will also be seeded with naturalized grasses and forbs. enXco will implement a postconstruction monitoring plan to measure the establishment of the restored grassland and will implement remedial measures as needed to ensure restoration success.

Site Preparation

Surveying and Staking of Construction Areas

enXco will survey and stake the locations of work areas—both temporary and permanent impact areas—prior to initiating work. These actions will be performed by a professional surveyor and will be based on the construction documents (i.e., plans and specifications) prepared for the project.

Grassland Soil Stockpiling Areas

The location of each soil stockpile area will be staked and identified prior to start of work to ensure that the stockpiled soils are not disturbed by construction activities. Existing ruderal vegetation will be removed and disposed of offsite. The soil stockpile areas will be encircled by orange protection fencing to clearly mark the areas and ensure that stockpiled soil is not used for other purposes.

Restoration

Grasslands will be restored where they are temporarily disturbed by construction and maintenance activities. Grassland restoration will entail the actions listed below.

- Restoring the land surfaces within the disturbed areas to preproject elevations.
- Spreading stockpiled topsoil over restored surfaces.
- Seeding disturbed surfaces.

Stockpiling of Grassland Topsoil

Prior to construction or ground-disturbing maintenance activity, the grading contractor will excavate and stockpile existing grassland topsoil for later reapplication. Separate topsoil stockpiling

areas will be identified and clearly marked. An approximately 3-inch layer of topsoil will be excavated from all disturbed grassland surfaces. The stockpiled soil will be left uncovered to minimize damage to propagation material from heat that can build under a cover. The soil stockpile areas will be encircled by orange protection fencing and clearly marked to ensure that stockpiled soil is not used for other purposes.

Grading of Restored Grasslands

After an area has been restored to the original grade, the grading contractor will survey, grade, and restore the annual grasslands to preproject elevations. The restored topsoil layer will be approximately 3 inches deep. The topsoil layer will not be compacted except for any wheel compaction that occurs during topsoil application. Equipment and vehicle operations should not occur on restored surfaces to avoid compaction of the topsoil.

Grassland Seeding

An erosion control seed mix will be used to seed all disturbed areas (Table 1). The seed mix will consist of grasses and wildflowers. The seed mix will be applied by the construction contractor. The seed mix will be applied during the fall immediately after completion of construction, to reduce the chances of erosion during the following winter.

Table 1. Erosion Control Seed Mix for Grassland Areas

Common Name	Botanical Name	Pounds Pure Live Seed Per Acre
California brome	*Bromus carinatus*	15
Soft chess	*Bromus hordeaceous*	15
Zorro fescue	*Vulpia myuros*	8
California poppy	*Eschscholzia californica*	2
Lupine	*Lupinus* spp.	2
Tomcat clover	*Trifolium wildenovii*	4
Total		46

The annual grassland seed mix will be applied as a hydromulch. The soil surface will be scarified before seeding to ensure better root penetration. On slopes greater than 3:1 (33%), the seed mix should be applied using hydroseeding methods, and a biodegradable erosion control blanket should be placed on the slope to further reduce the likelihood of erosion. The hydromulch will consist of biodegradable paper mulch dyed to ensure full coverage and a tackifier. The hydromulch will be applied at a rate of 2,500 pounds per acre. The tackifier will be applied at a rate of 100 pounds per acre.

Construction Inspections

Progress inspections and other interim inspections of the grassland restoration operations will be conducted by a biologist from enXco or its authorized representative to ensure that the mitigation is fully and properly installed to meet performance standards. enXco will inspect mitigation construction operations at the critical phases of implementation listed below.

- Identification of construction boundaries prior to construction.
- Placement and installation of protective fencing.
- Placement of stockpiled topsoil.
- Seeding operations.

The construction inspections will ensure that the intent and critical details of the restoration design are understood and executed by the contractor.

Monitoring and Maintenance

enXco will begin a 3-year (36-month) monitoring and maintenance period following completion of all initial annual grassland restoration activities. A biologist from enXco or its designated contractor will maintain the restoration site during these 3 years.

Watering, regular weeding, and other routine maintenance will not be required for restored grasslands. Grassland restoration areas will be monitored during the maintenance period, and if remedial measures are deemed necessary as a result of performance monitoring, enXco will implement those measures during the maintenance period.

Inspections

A biologist from enXco or its designated contractor will conduct reconnaissance-level inspections of the restored grasslands in conjunction with vegetation monitoring surveys to identify necessary corrective actions. The restored areas will be inspected for erosion, vandalism, and other problems and to identify necessary repairs or remedial measures. If remediation is required because of flooding, fire, vandalism, or other damage, enXco will confer with USFWS on the appropriate level of remediation and will implement the agreed-upon actions.

Monitoring Schedule

Vegetation will be monitored annually between March and May of years 1–3. Grassland monitoring may be discontinued before year 3 if the performance standards are met earlier than year 3.

Performance Standards and Success Criteria

Restoration areas will be monitored in years 1–3, and large (more than 500 square feet) bare areas will be identified and reseeded. At the end of 3 years, the restoration will be considered successful if no bare areas larger than 500 square feet are present.

Supplemental Seeding

All disturbed grasslands will be seeded after construction. These seeded areas will be maintained during the 3-year maintenance period. It is anticipated that the seeded areas will become vegetated by seeded species and colonized by other herbaceous species that occur in adjacent areas. Maintenance of seeded areas will include reseeding large bare areas. If reseeding is necessary, the soil will be manually scarified and seeded.

Annual Reports

enXco will prepare an annual monitoring report and submit it to USFWS by September 30 of each monitoring year. Each monitoring report will include the components listed below.

- A summary of the project location and description.
- A summary of the monitoring methods.
- A list of the names, titles, and companies of the people who prepared the content of the annual report or participated in monitoring activities that year.
- A summary and analysis of the monitoring results, including an evaluation of site conditions in the context of the performance standards and success criteria.
- A discussion of the monitoring results.
- Management recommendations, including discussion of areas with inadequate performance and recommendations for remedial action.
- A discussion of modifications made to the monitoring methods.
- A discussion of the previous year's maintenance efforts.

Remedial Measures

The purpose of this restoration plan is to ensure that the targeted physical and ecological functions are achieved. Remedial measures provide a mechanism for modifying the mitigation/enhancement program if the mitigation site:

- continually does not achieve the performance standards during years 1–3 or
- does not achieve the success criteria in year 3.

Remedial measures will be developed in consideration of the qualitative and quantitative monitoring results. To develop remedial measures, enXco will evaluate why a specific performance standard or success criterion was not achieved and will determine the most effective remedy.

Notification of Completion

enXco will notify USFWS when the success criteria have been met. A map of the restoration site and the annual monitoring report will be furnished with the notification to provide documentation to USFWS that the restoration requirements have been completed.

USFWS Confirmation of Completion

Based on the notification of completion, the annual monitoring reports, and if deemed necessary by USFWS during a site visit, USFWS will confirm that the restoration plan has met the success criteria and will provide enXco with written confirmation that its obligations have been achieved.